Journal
OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

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Vol. 133 **November 15, 1958** **No. 10**

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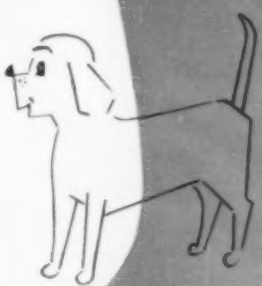

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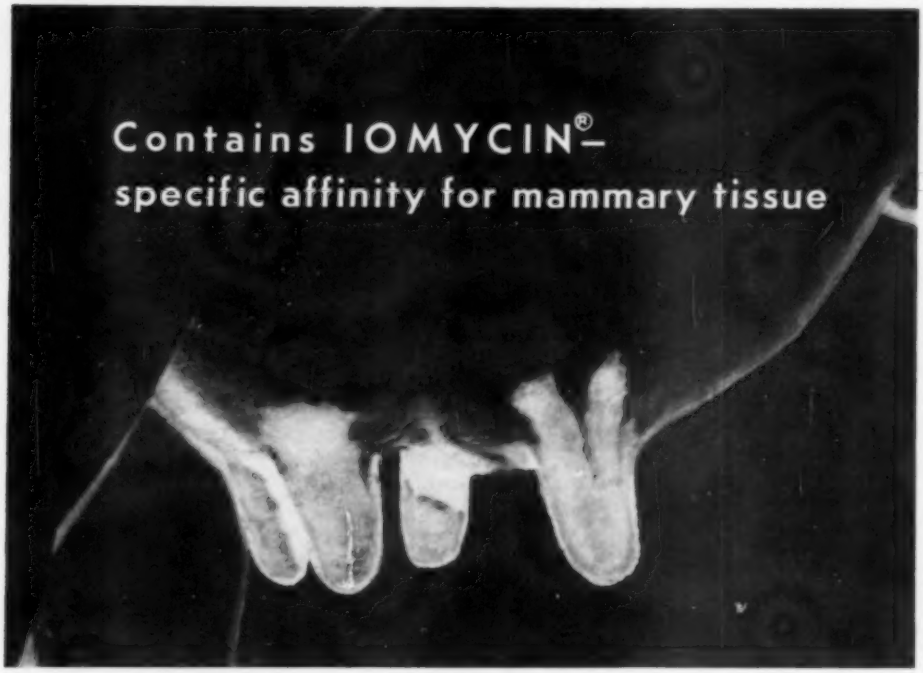

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Correspondence

August 28, 1958

Dear Sir:

The writer serves as an editor with the Williams and Wilkins Co., publishers of veterinary, medical, and scientific texts and journals. We have attended many AVMA conventions and have visited with the teachers of most of the veterinary schools. As a consequence, we believe that the importance of veterinary literature needs to be brought home to veterinarians, especially those in academic life.

Better books will not, in themselves, make better veterinarians. Nonetheless, good veterinary books can and should play an important role in educating student and practitioner alike.

Veterinary medicine has sometimes been accused of being "too much in the barnyard," of following in the advance of human medicine instead of leading that advance. If this be true, the lack of good veterinary texts and monographs is partially responsible.

Not so many years ago, veterinary students were introduced to their art through a tattered assortment of indifferently translated foreign texts and a few out-of-date American ones. In whole areas of veterinary medicine, the practitioner as well as the student was forced to extrapolate from the texts in human medicine. Publishers shied away from the veterinary field on the grounds that it was too small and barren of ideas.

In recent years, there have been some encouraging signs of life in veterinary publishing. The university presses, especially Comstock and the Iowa State College Press, have brought out a number of good textbooks to challenge the foreign translations and the badly out-dated domestic products. Lea and Febiger, a leading publisher in the medical field, gained something of a first by bringing out a large, lavishly illustrated, and handsomely printed textbook in veterinary pathology by Smith and Jones. Coffin's "Manual of Veterinary Clinical Pathology," published by Comstock, filled a gap where nothing at all had existed before. There is now a modern text on meat inspection, diseases of poultry, and sheep diseases. The American Veterinary Publishers have discovered a way to circumvent the academic veterinarian's reluctance to write by bringing out up-to-the-minute books on canine medicine, canine surgery, and cattle disease by 50 or more authors.

There are gaps waiting to be filled. There are over 25 titles in human medicine on body fluids. Yet, strangely enough, there isn't a single book on body fluids or body fluid imbalance in animals. There is only one text available on radiology in animal practice though there are about 1,500 x-ray machines in the hands of small animal practitioners. Some years ago, at an AVMA meeting, the author received many requests for a book on diseases of caged birds; none was available at that time and only a booklet has appeared since. There are any number of fields and subjects which badly need texts and monographs.

Publishers are no longer so reluctant to launch books in veterinary medicine. Though the field is small, it is eager, and good books yield a fair return. The problem today is to find the proper people to write the proper books.

Very truly yours,
s/R. KENNETH BUSSY
Baltimore, Md.

• • •

Oct. 8, 1958

Dear Dr. Aitken:

I read with interest the letter of Drs. J. A. Greene and John N. Tuttle in the JOURNAL of Sept. 15, 1958. From this I feel that certain aspects of the psittacosis problem require clarification.

Of the diseases found in birds, psittacosis constitutes one of the most serious hazards to man. The incidence of this disease in man is related to his exposure to infected birds. If such reservoir birds are cleared of the virus, the disease ceases to be a public health problem. Based on evidence presented by qualified investigators,[1-3] oral therapy with chlortetracycline-treated millet seed has attained this goal. Until a better procedure becomes available, this preparation should be applied to this problem.

Carefully controlled field trials with psittacosis-infected parakeets have not revealed the evolution of any antibiotic-resistant virus.

The preparation of chlortetracycline in millet seed is no haphazard development, but it represents the fruition of over three years of studies on which the results are documented, and production of which is under the regulation of the U.S. Food and Drug Administration.

It has been my feeling that a disease becomes a public health problem when its control exceeds the capacities of private practitioners. This was the case with psittacosis in parakeets, and still is with the same disease in domestic poultry (turkeys). Extensive studies now directed at this disease in turkeys will no doubt provide a suitable method of control. The magnitude of this problem should cast no unfavorable reflections on individuals or organizations, but it exemplifies the unexpected ramifications of a disease, coincident with changes in the relationships of parasite to host.

Sincerely yours,
s/MORRIS POLLARD, D.V.M.
Professor of Preventive Medicine
University of Texas, Medical Branch
Galveston, Texas

References

[1]Wong, S. C., and Cox, H. R.: Ann. N.Y. Acad. Sci., 51, 1958.
[2]Meyer, K. F., and Eddie, B.: Antibiotics Annual, 1954-1955. Medical Encyclopedia, Inc., N.Y., 1955.
[3]Meyer, K. F., et al.: in "Progress in Psittacosis Research and Control." Rutgers University Press, N.J., 1958.

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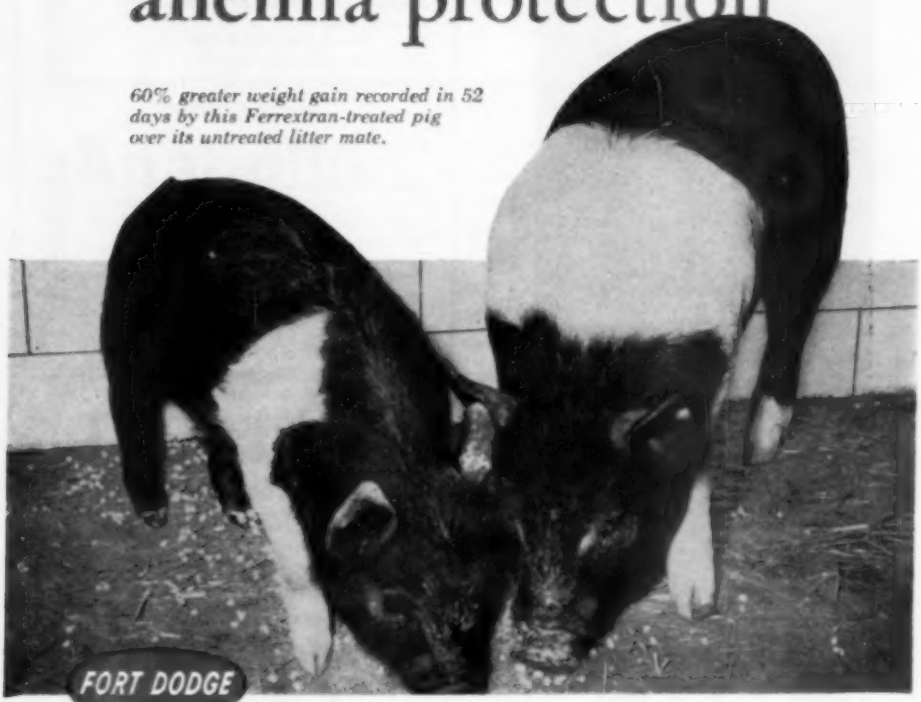

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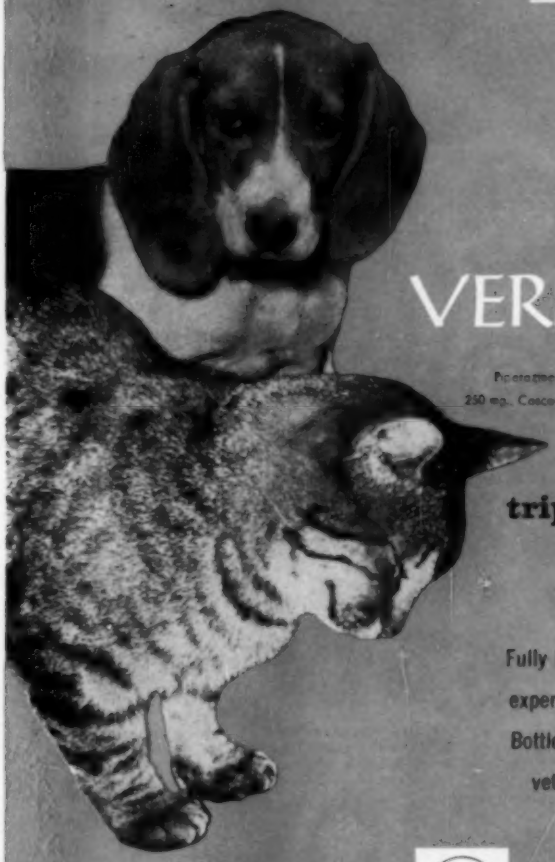

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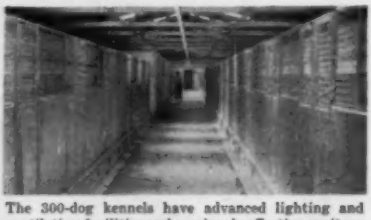

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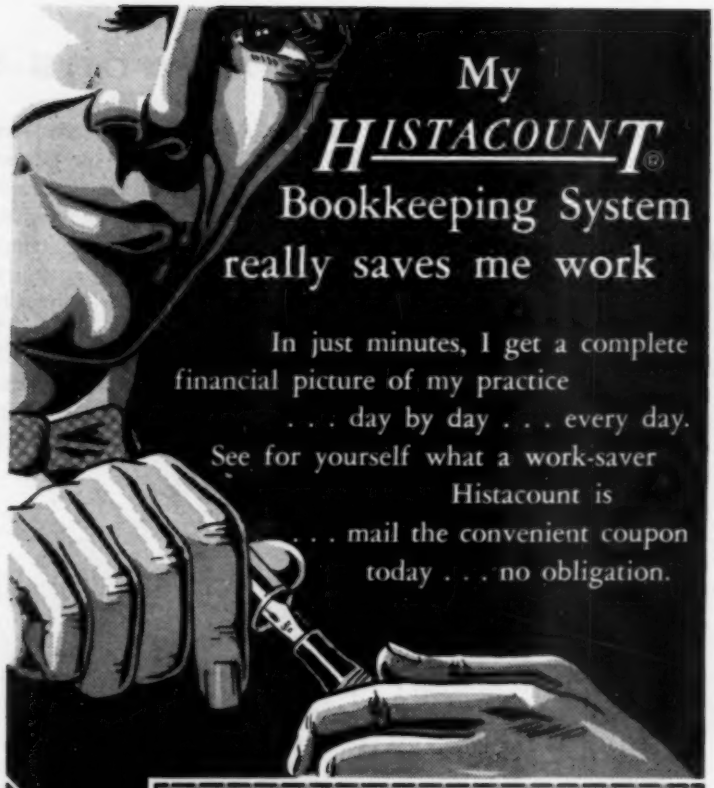
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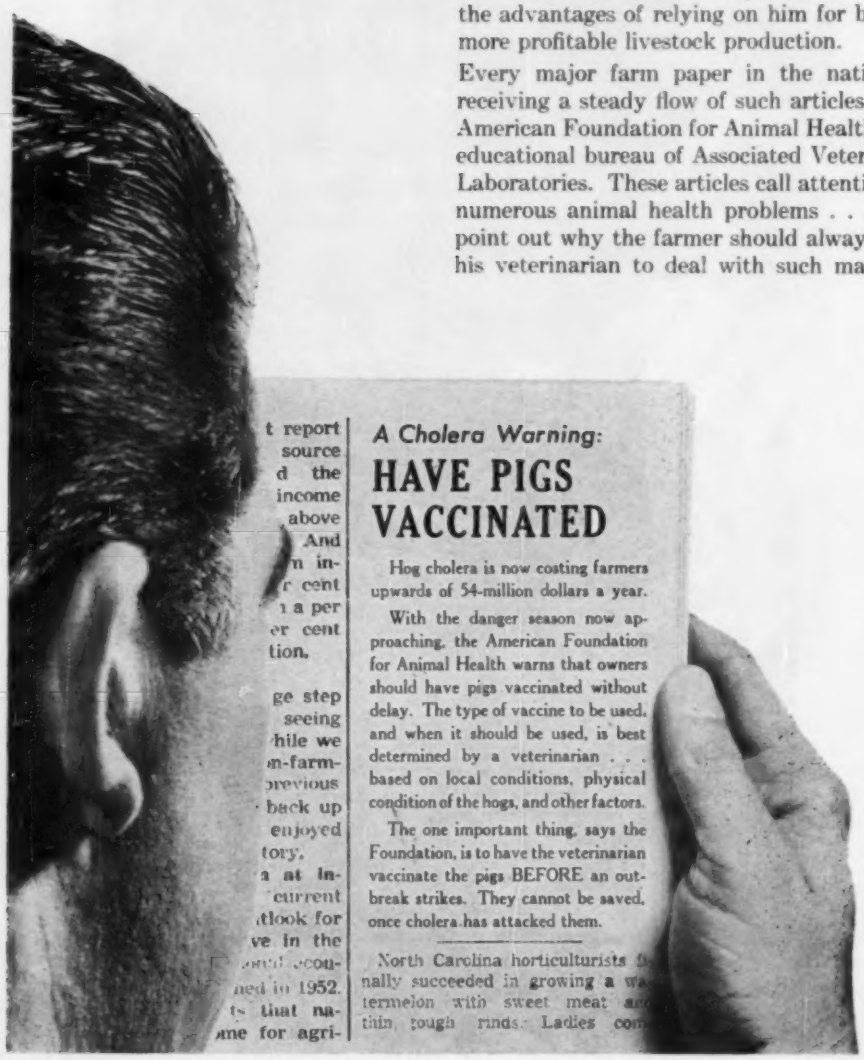
FARM EDITORS SAY,

All over America, farmers are reading about the veterinarian, these days, and learning the advantages of relying on him for better, more profitable livestock production.

Every major farm paper in the nation is receiving a steady flow of such articles from American Foundation for Animal Health, the educational bureau of Associated Veterinary Laboratories. These articles call attention to numerous animal health problems . . . and point out why the farmer should always call his veterinarian to deal with such matters.



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A Cholera Warning:

HAVE PIGS VACCINATED

Hog cholera is now costing farmers upwards of 54-million dollars a year.

With the danger season now approaching, the American Foundation for Animal Health warns that owners should have pigs vaccinated without delay. The type of vaccine to be used, and when it should be used, is best determined by a veterinarian . . . based on local conditions, physical condition of the hogs, and other factors.

The one important thing, says the Foundation, is to have the veterinarian vaccinate the pigs BEFORE an outbreak strikes. They cannot be saved, once cholera has attacked them.

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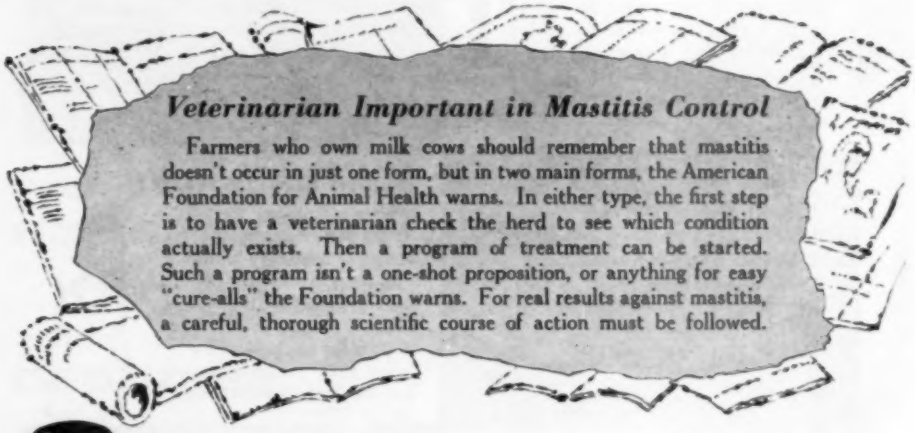

Veterinarian Important in Mastitis Control

Farmers who own milk cows should remember that mastitis doesn't occur in just one form, but in two main forms, the American Foundation for Animal Health warns. In either type, the first step is to have a veterinarian check the herd to see which condition actually exists. Then a program of treatment can be started. Such a program isn't a one-shot proposition, or anything for easy "cure-alls" the Foundation warns. For real results against mastitis, a careful, thorough scientific course of action must be followed.

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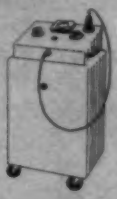

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Washington News

Military.—Appointments of **officers to fill vacancies in Regular Army and Air Force veterinary services** total 28. Accepting commissions in the Air Force veterinary service are: Lt. Colonels Wm. G. Sullivan (API '32), G. O. Thomas (TEX '38), O. G. Werntz (TEX '40); Majors J. A. Rehkemper (TEX '41), Maurice Verplank (ISC '45); and Captains De Paul Corkhill (UP '47); D. B. Gisler (OSU '55); Wm. R. Godden (COL '54); O. F. Goen (TEX '47); P. J. Homme (MIN '54); R. A. Hoffman (TEX '55); E. C. Pebley (UP '55); R. E. Pope (MO '55); Leo A. Whitehair (KSC '53); Joe T. Williams (API '55); R. E. Smith (COL '52); G. M. Yarbrough (API '52); R. F. Ziegler (ILL '55); and N. P. Clark (TEX '54). Those offered **commissions in Army Veterinary Corps** are: Lt. Colonels G. A. Kuhn (WSC '30), E. H. Akins (OSU '37), W. M. Osteen (KSC '35); Major H. F. Brown (API '47); Captains G. M. Hughes (API '47), G. F. Fischer (MO '54), R. W. Sheehy (API '49), P. D. Lampru (API '49); and 1st Lt. R. G. Oakes (COL '56). Grades are those in which each was serving at time appointment offered and are not necessarily those after appointment in the Regular Army or Air Force.

Because of forthcoming separations during current fiscal year, **there will be a limited number of vacancies** in grade of first lieutenant in the Army Veterinary Corps (see JOURNAL, Sept. 15, 1958, adv. p. 12).

Major General Dan C. Ogle, Air Force Surgeon General the past four years, **retires in November.** He served as Deputy Surgeon General for the five years preceding his appointment to the top medical position in the Air Force. **Major General Oliver Niess,** now command surgeon of Pacific Air Forces in Hawaii, will take over as Air Force Surgeon General on Dec. 1, 1958.

* * * *

Miscellaneous.—The Post Office Department **proposal to exclude airmail shipment of viruses,** toxins, and other etiological agents (**Fed. Reg.,** Aug. 23, 1958) **has been abandoned.** The announcement appearing in the **Federal Register,** Oct. 2, 1958, is official confirmation. The major factor in this decision, it is understood, is the drafting by the Public Health Service of new packaging requirements.

A two-year survey on a variety of samples of foods produced since 1945 shows **radiation in most foods is not "significantly high."** Certain seafoods, dairy products and tea were exceptions, but even in them there is little danger as commonly consumed. Ratings were made by comparing the foods with similar samples produced prior to 1945.

HEW Secretary Fleming, in a recent news conference, cited P.H.S.-F.D.A. **contributions in the field of radiological health.** He stated that 43 stations have been set up in the states and territories for measurement of radioactivity, 45 for testing water, nine for milk sampling, and others for collection of food samples (by F.D.A.) to gather data on changes in radioactivity in foods. The Secretary noted that some states have begun to develop trained staffs, modern facilities, and programs in radiological health.

* * * *

Food and Drug Administration (**Fed. Reg.,** Oct. 9, 1958) has ruled that **apple pomace containing more than 7 p.p.m. of DDT is unsuitable for use in animal feeding.** The F.D.A., in official release (Oct. 18) stated it will be illegal for a processed food or feed to contain more residue of a pesticide than allowed on the raw product from which made, unless a higher tolerance is granted for final product. Tolerance for DDT on apples is 7 p.p.m. Also cautioned apple pomace containing DDT **in any quantity not suitable for** feeding dairy cattle; there is also risk of producing illegal meat if it is fed to meat animals since they may accumulate considerably more in their fat than present on the feed because DDT is stored and accumulated in fat tissue.

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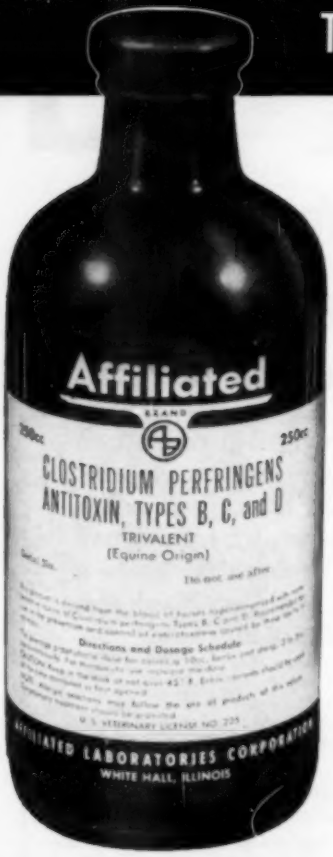

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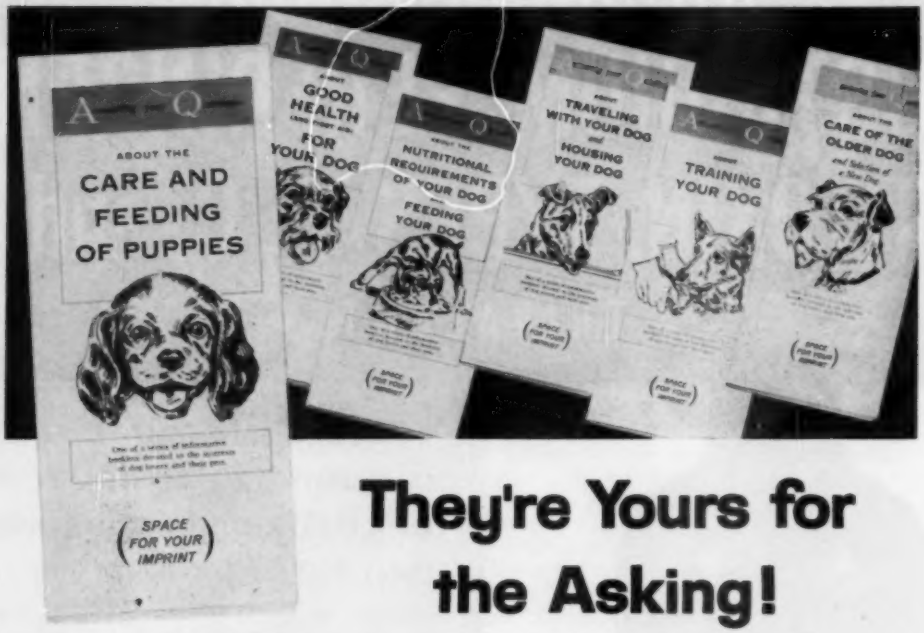

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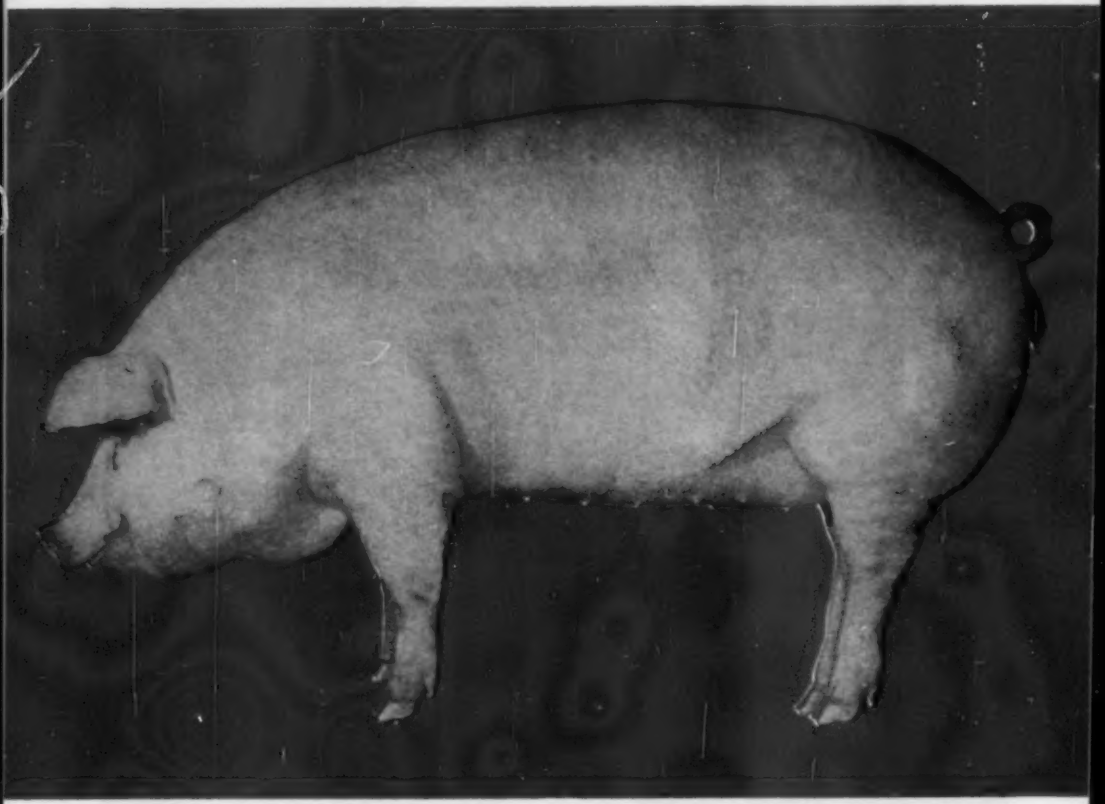

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Retained Fetal Membranes—The Effect on Prolificacy of Dairy Cattle

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Pullman, Washington

PREVIOUS REPORTS of studies using breeding records from the Carnation Milk Farms' Holstein-Friesian herd have shown that the fetal membranes (f.m.) were retained at 10.3 per cent of 7,387 calvings.[12] The rate was 6.7 per cent following birth of 6,162 living single calves. Similarly, the rates were 43.8 per cent for 311 twin births, 25.9 per cent for 636 abortions, and 16.4 per cent for 270 stillborn single calves.[12]

The irregularity of estrous cycles following retained f.m. was not significantly different among otherwise clinically normal cows when compared with other clinically normal cows.[5] However, subsequent to retained f.m., a higher percentage of cows were clinically abnormal. These cows had significantly more 26- to 35-day cycles whether the f.m. were retained after a living single birth or in conjunction with stillbirths, abortions, or twins.[5]

Although the most immediate cause of irregular estrus was associated with genital infections, retained f.m. was undoubtedly a contributing factor. It was found that infertility was a problem in 40 per cent of all cows having retained f.m., but the other 60 per cent conceived as well as the average for the herd.[14]

Though the association of retained f.m. with genital infection can not be underemphasized, recent findings indicate a possible relationship between naturally low progesterone and early calving, abortion, and retained f.m.[11] Using the Carnation herd records, it was estimated[6] that heritability for retained f.m. was 38 per cent (additively genetic portion). These findings indicate that physiological imbalances as well as pathogenic factors are involved and, even if the latter were eliminated, retained f.m. would still occur.

The present study was undertaken to determine the probable influence of retained f.m. on reproductive rates and its association with other reproductive phenomena.

SOURCE OF DATA

The breeding and clinical records covering a 30-year period (1920 to 1950) of 9,994 breeding periods of 2,607 Holstein-Friesian cows from Carnation Milk Farms, Carnation, Wash., were used.[12] Only since 1925 did the records include all dates of estrus. Staff veterinarians recorded all results of clinical examinations on one side of individual cow-history cards. The herdsman kept other breeding and pedigree information on the opposite side.

The data were adapted to International Business Machine procedures. Dates of conditions affecting reproduction were tabulated and all interval calculations were made by electronic means.

Cows (except those on official test) were expected to calve once yearly. Cows on official test were generally milked for 365 days and were bred to calve at 14- to 15-month

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This work was done under a cooperative agreement with Carnation Milk Farms, Carnation, Wash. Dr. Hinze and Dr. Gildow are resident veterinarians. Dr. Morrison is presently with the Quaker Oats Co., Chicago, Ill.

intervals. Since their time, from calving to first service and to conception, averaged 60 days longer than for cows not on official test,[12] estimates of reproductive rates and days from calving to first service were lowered 60 days for each cow in the respective subgroup which was on official test. General factors influencing reproductive capacity and infertility rates have been published[12] and will be referred to only for comparative purposes.

RESULTS

General.—Of 2,607 cows, 1,905 calved one or more times during the study. From a total of 7,387 calvings, there were 760 cases (10.3%) of retained f.m. among 544 (28.6%) of the 1,905 cows. There was a strong tendency for the cows to retain f.m. at subsequent calvings. The rate was 19.2 per cent among the 297 cows which had 1 or more calves after an initial retention of the f.m. Two cows retained the f.m. at six different calvings and 144 others had from two to five retentions.

Subclass confidence limits (subclass confidence limit=mean $\pm$ t0.05 $\sqrt{P(1-P)/n}$ were used as the test for significant variations. First calf cows had a significantly lower rate than each of the rates for calving periods three through 12. When retained f.m. rates were determined at each calving period for those cows not previously having the disorder, the rate was still significantly lower among first calf heifers and increased about 2.5 times by the fifth calving.

It is of interest that cows reaching their tenth calving period without retaining a f.m. were no more likely to retain one at subsequent calvings than at the third or fourth calvings. The last column in table 1 shows that the percentage of cows not yet having retained f.m. at each consecutive calving period declines until the seventh calving period.

Between the seventh and tenth calving periods, cows previously having retained f.m. left the herd at proportionately the same rate as cows not having retained f.m after first calving and increased to nearly 25.0 per cent at the ninth calving.

TABLE 1—Relation of Calving Period to Incidence of Retained Fetal Membranes (R.F.M.)

Calving period	Total cases			First case — each cow			Cows not yet having R.F.M. (%)
	Cows calving (No.)	R.F.M. (No.)	R.F.M. (%)	Cows calving (No.)*	R.F.M. (No.)	R.F.M. (%)	
1	1,602	87	5.4	1,602	87	5.4	100
2	1,148	90	7.8	1,051	86	8.2	92
3	903	79	8.7	780	68	8.7	86
4	720	69	9.6	579	55	9.5	80
5	565	80	14.2	416	55	13.2	74
6	428	69	16.1	299	39	13.0	70
7	321	50	15.6	216	22	10.2	67
8	239	33	13.8	164	14	8.5	69
9	156	38	24.4	105	15	14.3	67
10	98	21	21.4	68	6	8.8	69
11	58	13	22.4	44	3	6.8	76
12	28	8	28.6	23	2	8.7	82
13	9	1	11.1	7	0	0.0	78
14	2	0	0.0	1	0	0.0	50
15	1	0	0.0	1	0	0.0	100
Total	6,278	638	10.2	5,356	452	8.4	85
Others**	1,109	122	11.0	.....	.....	...	...
Study total	7,387	760	10.3	.....	.....	...	...

*No. of cows not previously having an R.F.M.; **calving period number not known—includes purchased cows and cows in herd at the start of the study.

Age Relationships.—The 1,602 heifers which had their first calf during the study period were used to determine the retained f.m. rates at consecutive calving periods one through 15. Comparisons were made: (1) of the total cases at each calving period, and (2) of the rates at each calving period for cows not having a retained f.m. at an earlier calving (table 1).

The rate for all cows was 5.4 per cent at

After the tenth calving period, cows with a previous history of retained f.m. left the herd at a faster rate. These data imply higher infertility rates among cows subsequent to retained f.m. and will be discussed later in more detail.

Periods of Time.—Some had hoped that when brucellosis was eradicated, retained f.m. would cease to be a problem. By use of rigid sanitation at parturition and subse-

TABLE 2—Retained Fetal Membrane (R.F.M.) Rates During Different Periods Divided According to General Pathogenic Conditions

Period of time	Total calving	Abortions (%)	R.F.M. (No.)	R.F.M. (%)	R.F.M. (Range —%)	Remarks
Before 1926	1,075	10	71	7	2-22	Information not complete.
1926-31	1,826	13	197	11	8-15	Brucellosis prevalent—abortion rates high.
1932-40	2,226	10	242	11	7-17	No brucellosis—other genital infections prevalent (natural breeding).
1941-50	2,260	5	250	11	7-15	No brucellosis—no other specific venereal disease identified (artificial breeding).
Study total	7,387	9	760	10	2-22	

quent breeding by artificial service, much improvement has been observed in general genital health. Artificial service with semen from healthy bulls is effective for the control of vaginitis, vibriosis, trichomoniasis, and other nonspecific causes of genital infections.

During this 30-year study, marked changes occurred in the genital disease status of this herd. Brucellosis had been epizootic but, through use of regular testing and isolation of reactors on another farm, the main breeding herd was free of brucellosis after 1931. Problems commonly encountered when using bulls naturally were experienced from 1932 through 1940. Several hundred animals required treatment for vaginitis and uterine inflammations. Vibriosis and trichomoniasis may have affected some cows before 1941, but the evidence is not clear.

After 1940, all breeding was done artificially and, by 1943, abortion rates were generally less than 5 per cent. The gross genital health of the cows has unquestionably been superior since 1940. The data on four periods are summarized (table 2).

The records before 1926 are probably incomplete and little significance is attached to them. It is of interest that retained f.m. rates for the remaining three periods were identical. While year to year variations were pronounced, only one year, 1940, was significantly different at the 5 per cent level of probability from the mean of all.

On the basis of chance, one would expect at least one year in 20 to be significantly different because of random variation. Therefore, if retained f.m. are caused entirely by pathogens, the variations in pathogenic conditions during the study period were not great enough to yield significant differences.

Months.—Monthly variations in rates of retained f.m., twins, and abortions are sizeable (table 3). Since retained f.m. rates were much higher after twin and abortive births, a higher or lower than average rate of such births in certain months would influence the observed retained f.m. rate.

In December, there were significantly fewer retained f.m. (7.8%), twins (2.5%), abortions (7.6%), as well as retained f.m.

TABLE 3—Retained Fetal Membrane (R.F.M.) Rates by Months and Comparisons with Percentages of Normal Single Births, Twins, and Abortions

Month	Total calvings	R.F.M. (%)	Twins (%)	Abortions (%)	Single Births Normal* (%)	Single Births R.F.M.** (%)
January	657	11.3	4.3	7.8	78	7.4
February	706	9.8	4.4	7.4	80	6.9
March	723	8.6	3.9	8.4	80	6.8
April	660	11.7	5.3	7.7	79	7.3
May	666	9.5	4.1	8.3	79	5.9
June	534	10.7	4.9	9.2	78	5.6
July	539	12.1	5.2	10.6	74	8.3
August	546	9.7	3.7	11.5	76	6.5
September	547	11.9	5.5	12.1	74	7.1
October	562	12.3	4.3	8.7	76	8.7
November	619	9.2	3.1	10.7	76	5.8
December	628	7.8	2.5	7.6	81	4.0
Total	7,387	10.3	4.2	9.0	78	6.7
July-October	2,194	11.5	4.6	10.7	75	7.7
Other months	5,193	9.8	4.0	8.3	79	6.3

*Normal living single births not including those with R.F.M. compared with total calvings; **R.F.M. rates among single nonabortive births.

TABLE 4—Relation of Type of Birth to Retained Fetal Membranes (R.F.M.)

Type of calving	Calving condition: Previous to R.F.M. (No.)	(%)	When R.F.M. occurred (No.)	(%)	Next calving after R.F.M. (No.)	(%)
Living single—no R.F.M.	492	75.0	.....	.....	311	65.8
Living single—R.F.M.	69	10.5	429	56.4	64	13.5
Dead single—no R.F.M.	18	2.7	.....	.....	15	3.2
Dead single—R.F.M.	7	1.1	45	5.9	8	1.7
Twins—no R.F.M.	15*	2.3	.....	.....	20†	4.2
Twins—R.F.M.	12*	1.8	136**	17.9**	6‡	1.3
Total twins	27	4.1	136	17.9	26	5.5
All abortions—no R.F.M.	32	4.9	.....	.....	36	7.6
All abortions—R.F.M.	14	2.1	167	22.0	20	4.2
Total abortions	46	7.0	167	22.0	56	11.8
Total R.F.M.	99	15.1	760	100.0	96	20.3
Total	656	.....	760	100.0	473	.....

*Three sets aborted and recounted under abortions; **16 sets aborted and recounted under abortions, making percentage total 2.2 per cent too high; †5 sets aborted and recounted under abortions; ‡2 sets aborted and recounted under abortions.

among nonabortive single births (4.0%); whereas in the summer months of July, August, September, and October, these events were generally above the herd average. Comparing the combined average of these months with that of the remaining months reveals that retained f.m. rates among all births (11.5%) and among single nonabortive births (7.7%) were significantly higher during these months (table 3). Further, there were significantly more abortions (10.7%) and significantly fewer normal living single births without retained f.m.

Types of Calvings.—Calvings were listed as living singles, dead singles, twins, and abortions with and without retained f.m. These types were distributed for the calvings previous to, concurrent with, and the next following a retained f.m. (table 4). Of 656 births preceding retained f.m., 492 (75.0%) were living single calves and 10.5 per cent were followed by retained f.m.; whereas, expected rates were 78 per cent and 6.7 per cent respectively (table 3).

Twinning rates were comparable with herd average, and abortions were below average (7.0 vs. 9.0%). Though twins (4.2%) and abortions (9.0%) represented 13.2 per cent (table 3) of all births, these types of births were involved in 37.7 per cent of the 760 cows with retained f.m.

As compared with the herd average (table 4), more births were abnormal at the next calving after retained f.m. (1% more dead calves, 1.4% more twins, and 4.8% more abortions). The retained f.m. rate was nearly 6 per cent higher among living single births and double the herd average for all births (tables 3 and 4). The higher twinning rates could have been due to the greater age of the cows at each successive calving.

Influence on Reproduction Rates.—The effect of retained f.m. on fertility is difficult to evaluate because of its close association with dead calves, twins, abortions, and genital infections. One approach (table 5) was to compare the average number of calvings after an initial retained f.m. with

TABLE 5—Evidence for Greater Infertility Subsequent to Retained Fetal Membrane (R.F.M.) (Based on Calving Expectancy)

Calving period	Herd total*: Cows calving**	Av. calv./cow afterward	Not calving (%)	R.F.M. group*: Cows calving	Av. calv./cow afterward	Not calving (%)
1	871	3.9	18	55	2.7	40
2	686	3.8	15	65	2.9	23
3	574	3.4	13	57	2.6	35
4	490	3.0	17	45	2.9	16
5	403	2.6	22	45	1.9	29
6	318	2.3	22	28	2.2	21
7	249	2.0	20	20	1.4	40
8	198	1.6	34	13	0.6	62
9	124	1.3	35	12	1.8	33
Over 9	168	0.8	49	10	0.4	60
Total	4,081	3.0	20	350	2.4	31

*Does not include cows sold for dairy purposes and those in the herd before and after the study; **cows having R.F.M. were excluded.

the average for the remaining cows in the herd at comparable calving periods.

Heifers not having retained f.m. averaged 3.9 calves before leaving the herd, as compared with 2.7 calves by heifers retaining the f.m. at first calving. The average for all ages was 3.0 vs. 2.4 calves. The percentage of animals leaving the herd because of death or slaughter, and not pregnant, was approximately twice as high for cows having retained f.m. during the first three calving periods than for the remaining cows. After this time, the differences were less.

There is little question that one can expect the reproductive life of a cow to be materially reduced, especially when a comparatively young cow retains the f.m. These losses are probably much greater on the average dairy farm because the veterinarian may be called too late to prevent extensive uterine damage or to promptly treat subsequent genital infections.

The usual criteria for measuring reproductive performance are shown for retained f.m. (table 6). Herd averages are included for comparative purposes. There is little evidence that retained f.m. in the absence of subsequent reproductive abnormalities adversely affects reproductive rate. Similarly, cows with retained f.m. followed by other reproductive disorders conceived about as readily as all cows with reproductive disorders.

There was a measurable reduction in reproductive rates as measured by total calvings when retained f.m., twins, abortions, and stillbirths were involved in the absence of other reproductive disorders. The comparison was made with cows having normal single living calves; their 3,416 reproductive periods averaged 1.7 services for conception with a calving interval of 365 days (table 6).

The differences are greater for this latter comparison than on a comparable comparison involving and not involving retained f.m. Unfortunately, the data do not reveal if previous pathological conditions were a primary cause of retained f.m. However, it is clear that reproductive disorders are more frequent after retained f.m. The herd average for disorders other than those associated with calving was 30 per cent in normal reproductive periods compared with 50 per cent subsequent to retained f.m.

Disorders the Previous Calving Period.—Of 544 cows, 80 (14.7%) had genital disorders during the reproductive period which ended with a cow's first retained f.m. There were 132 others (24.3%) with genital disorders during one or more calving periods previous to an initial retained f.m. This left 61 per cent with no observed genital disorders prior to initial retention of the f.m. If one considers only the reproductive period leading to retained f.m.,

TABLE 6—Influence of Retained Fetal Membranes (R.F.M.) on Reproductive Rates

Cow group	No. of periods	Age at calving (yr.)	Gestation (days)	Days to first estrus	Days to first service	S/C*	Total S/C	Calv. interval** (days)	Av. days in herd for cows not conceived***
					R.F.M.				
No path.† after calving									
Living singles	204	7.9	279	87	106	2.3	2.7	424	216
Dead singles	20	8.6	270	88	90	2.1	4.4	393	248
Twins‡	60	7.7	271	99	124	2.1	2.3	447	125
Abortions‡	95	5.3	203	67	98	2.1	2.5	520	123
Subtotal	379	7.3	258	84	106	2.2	2.7	447	179
Path.† after calving									
Living singles	225	8.1	278	72	111	3.9	5.5	511	516
Dead singles	25	7.3	275	68	100	3.2	5.6	454	470
Twins‡	61	7.7	269	96	149	3.6	5.6	516	575
Abortions‡	72	6.5	204	64	105	3.1	6.8	477	418
Subtotal	383	7.7	262	74	115	3.7	5.8	502	502
					Herd averages				
No path. after normal calv.§	3,416	6.0	280	66	73	1.7	1.8	365	143
No path. afterward (all calv.)	7,007	6.0	271	65	91	2.1	2.4	415	184
Path. afterward (all calv.)	2,987	6.3	269	61	104	3.4	4.6	506	519
Herd totals	9,994	6.1	270	64	96	2.5	3.0	442	300

*Services per conception; **calving interval for those which conceived; ***average days since last calving for cows and days from first service for heifers disposed of and not pregnant; †Path. refers to all pathological changes in the genital tract and ovaries observed during the reproductive period, not including abnormal calvings or short estrous cycles; ‡aborted twins summarized only under abortions; §normal calving was birth of a living single calf without R.F.M.

TABLE 7—Relation of Number of Services to Total Conceptions Among Cows Genitally Normal and Abnormal After Retaining Fetal Membranes

Cow grouping	Cows which conceived at service number (%)				
	1	3	5	7	Total
All normal cows—herd total	51	78	87	89	90
Normal after R.F.M.	45	67	79	84	87
All abnormal cows—herd total	26	58	74	82	86
Abnormal after R.F.M.	25	46	62	69	78

then 85 per cent of the cows showed no gross clinical disorders.

Chances for Conception.—How long treatment and attempts at conception should be continued obviously depend on the value of the cow, type of replacement available, etc.

Cows remaining genitally normal after a retained f.m. conceived about as readily as other comparable cows in the herd (table 6). Actually, 45 per cent conceived on first service as compared with 51 per cent for all genitally normal cows (table 7). Comparisons are also shown for three, five, seven, and more than seven services and for genitally abnormal cows (table 7).

The interval from calving to conception was used to estimate the practical length of time required for conception (table 8). Thus, time periods after calving were separately summarized in an effort to eliminate those cows sold for dairy purposes before demonstrating their ability or inability to conceive. Of cows in group 1 (clinically normal), 31 per cent conceived by 125 days after calving and 15 per cent had been removed from the herd, mostly to other dairy herds. In contrast, only slightly more than one half as many of the abnormal cows (groups 3, 4) had conceived and less than 3 per cent had been removed from the herd.

For cows not conceived and in the herd after 125 days, 70, 61, 55, and 54 per cent conceived by 400 days after calving, respectively, for groups 1 to 4 (table 8). Others conceived after 400 days but intervals up to two years were required.

If the 760 cows (table 8) are considered as a single group, 82 per cent of those which eventually conceived did so within 300 days after the previous calf. Most dairymen would dispose of a cow not in calf by then. Of the 109 cows not in calf at 300 days, 40 were in calf at 400 days and 19 others conceived later.

From these data, it is questionable that much is to be gained by keeping a cow that has failed to conceive after five services and after 400 days. Each case would have to be judged on the clinical condition and value of the cow. However, further consideration should include: (1) greater probability that the cow will retain a f.m. at the next calving; (2) greater probability, if previously infected, that she will again be infected; (3) if not previously infected, the chances are greater that such will occur if the f.m. is again retained; and (4) the evidence that retained f.m. is a partially heritable characteristic.

DISCUSSION

Five factors in these data indicate that the cause of retained f.m. is not entirely pathogenic: (1) Of 311 twin births, 43.8 per cent had retained f.m.;[12] (2) significantly more daughters from dams having retained f.m. had retained f.m. as compared with daughters from dams not retaining f.m.;[6] (3) significantly more male calves were associated with retained f.m. (56% vs. a 51.65% herd average[6])—of 137 sets of twins accompanied by retained f.m., 47 were both male, 23 were both female, and 67 were mixed;[6] (4) most (85%) of the cows had no grossly observable genital dis-

TABLE 8—Comparison of Intervals from Calving to Conception in Cows Genitally Normal and Abnormal After Retaining Fetal Membranes

Group No.	Genital status	No. of cows	Status at 125 days			Cows (%) left at 126 days which conceived by (days after calving)					
			Conceived (%)	(Sold—%)	No. cows left at 126 days*	200	250	300	400	Total	Not conceiving (%)
1	Normal before and after	292	31	15	159	36	47	54	70	77	23
2	Abnormal before—normal after	197	23	18	115	30	39	48	61	68	32
3	Normal before—abnormal after	112	14	1	93	19	26	41	53	75	25
4	Abnormal before—abnormal after	159	18	3	126	21	31	44	54	63	37
Total		760	24	11	495	28	37	48	61	71	29

*No. of cows still in herd and not conceived; cows not conceiving in this group can be considered relatively infertile.

orders in the reproductive period terminating with an initial retained f.m., as compared with the herd average of 30 per cent and as compared with 50 per cent in cows with reproductive periods commencing with a retained f.m.; (5) cows with normal genital tracts following retained f.m. were nearly as fertile as normal cows not having retained f.m. Of these five factors, the first three perhaps offer the superior evidence that retention of f.m. is not entirely pathogenic.

The sensitivity of the uterus may be altered by inflammatory reactions caused by pathogenic agents to the extent that endocrine imbalances may by created. The reverse is also possible—an unbalanced endocrine mechanism may lead to changes in susceptibility to infection. Research indicates that the luteal phase uterus is more vulnerable to inflammatory reactions than the follicular phase uterus of rabbits and cows,[1,4,10] that certain bacteria in ejaculated semen can cause pyometra in rabbits,[2,10] and that repeat breeder luteal phase cows do not show the same reaction as luteal phase virgin heifers.[4] It is possible that pathogenic conditions are initiated at the time of service and are largely unobserved until after the following calving. These data[6] also show significant differences in retained f.m. rates attributable to service sire.

Grossly unobservable low grade infections of the reproductive tract also add to the difficulty of interpreting results, since several workers[7-9,13] have found indications of infection in a high percentage of grossly normal cows as well as infertile cows.[7-9] However, if all grossly normal cows which retained a f.m. had low grade unobserved infections which caused the retention, one would expect such cows to be distinctly more infertile, but this was not the case (tables 6 to 8).

Explanation of these and earlier results[6] best includes physiological impairments which are more easily developed under unfavorable environmental conditions in some cows than in others. Under this hypothesis, the retention of f.m. could be materially reduced by pathogenic agents and genetic control measures.

SUMMARY

1) The fetal membranes (f.m.) were retained at 10.3 per cent of 7,387 calvings and occurred one or more times in 28.6 per cent of the 1,905 cows observed.

2) The rate was 5.4 per cent among first calving heifers and increased approximately four times by the ninth calving.

3) Retained f.m. rates were 11 per cent on a per-calving basis during each of three periods—one involving brucellosis, one involving natural service and no brucellosis, and a third involving artificial service.

4) Young cows averaged approximately one less calving after initially retaining the f.m. than comparably aged cows not retaining the f.m.

5) Retained f.m., twins, and abortions were generally higher among cows calving from July through October.

6) Cows not having genital disorders following a retained f.m. were nearly as fertile as other normal cows, but genital disorders were more likely to occur (50% vs. 30% herd average).

7) Twin births and abortions, representing 13.2 per cent of all calvings, were involved in 37.4 per cent of the 760 cases of retained f.m.

8) The total evidence precludes the possibility that retained f.m. is caused entirely by previous pathological conditions.

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Technique for Dental Radiography in Cattle

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DURING THE COURSE of an intensive study of the chronology of tooth development in cattle, it became necessary to obtain large numbers of intraoral dental radiographs of incisor teeth. The technique had to be simple, rapid, inexpensive, accurate, and applied without danger of injury to large numbers of cattle with known birth dates and optimal developmental histories. The technique is presented in this paper.

MATERIALS AND METHODS

Restraint of the cattle was accomplished by the use of a squeeze chute or stanchion (fig. 1). The head was immobilized either with nose tongs or a rope halter (fig. 3).

The film used was Kodak medical x-ray no-screen film cut to 3 by 3½ inches and inserted into a manila envelope slightly larger than the film. This in turn was covered with thin aluminum foil which was folded to exclude all light. To identify the film, a number was painted on the surface of the foil with lead paint (fig. 2).

Just prior to use, the prepared film was placed in a special cassette constructed of polyethylene with a shoe hook on each end (fig. 2). A heavy elastic band was attached to the hooks to hold the packet in place inside the mouth (fig. 1).

Fig. 1—Restraint of a cow, with cassette in place, for dental x-ray.

Various machines were tried but it was found that the most convenient was the General Electric Mobile Unit "90," equipped with an electronic timer. This machine develops up to 90 kv. and 20 ma. per second. The x-ray head can be rotated and is easily positioned. The whole machine is fairly light and easily transported.

Dr. Christofferson is with the agricultural division, Columbia-Geneva Division of the U.S. Steel Corp., Provo, Utah; and Dr. Weiss is research associate, Department of Pedodontics, University of Illinois College of Dentistry, Chicago.

Presented before the Section on Research, Ninety-Fifth Annual Meeting, American Veterinary Medical Association, Philadelphia, Pa., Aug. 18-21, 1958.

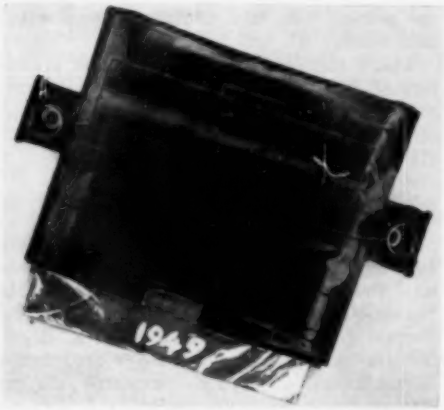

Fig. 2—Plastic cassette showing the hooks and containing the numbered film.

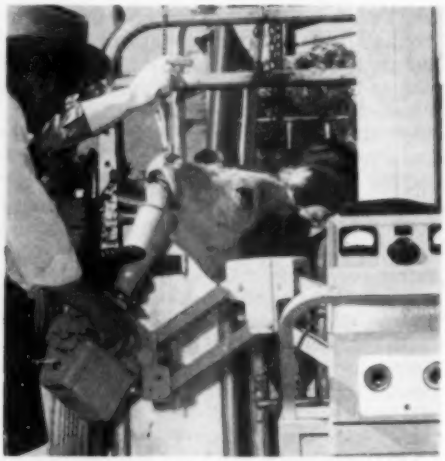

Fig. 3—The cone of the x-ray head is positioned at right angles to the cassette and touching the skin under the mandible.

It was found that the optimal exposure at 18 inches was 2/5 seconds at 60 kv. and 10 ma. The head of the machine was equipped with a truncated cone 18 inches long which prevented excessive scatter of radiation and produced pictures with minimal distortion, even at extreme angles (fig. 4). This method resulted in consistently good radiographs in cattle of all age groups.

The procedure for taking the radiograph was to first properly restrain the animal with neck squeeze or stanchion. A nose lead or halter was then attached and the head of the animal was pulled upward and to the side and tied. The cassette was inserted into the mouth with the forward edge protruding just above the edge of the incisor teeth. The elastic band was then placed under the chin. The cone of the x-ray head was positioned at right angles to the cassette and touching the skin under the mandible.

The person controlling the animal's head wore a leaded apron, leaded gloves (fig. 3.), and a dosimeter which was checked periodically. The procedure was accomplished quickly, with no injury to the animal, in an average of three minutes per animal. More than 1,000 cattle of all ages and breeds and of both sexes have been satisfactorily radiographed using this technique.

DISCUSSION

The present investigation was initiated because it became essential to study the exact chronology of tooth development in cattle in order to better assess the time factor involved in dental fluorosis.

The damage to the tooth enamel by fluoride absorption occurs only while the tooth is developing.[1] In order to establish the exact chronology of tooth development in cattle it was necessary to radiograph the mouths of a large number of living animals whose birth dates and nutritional conditions were known exactly.

Fig. 4—Typical radiograph of the teeth of a 854-day-old female Holstein-Friesian.

Incidental to this study, a means of determining the age of cattle less than 4 years old was developed and proved much

more accurate than the current practice of "aging" animals by the state of eruption and wear of their incisor teeth. While eruption of teeth may vary considerably, due to a variety of extrinsic factors, the development and calcification of teeth is relatively more constant.[2]

This technique should be valuable for research in many phases of veterinary medicine and animal breeding, since developing teeth are easily affected by many extrinsic factors. Until the calcification process is completed, the effect of these factors is permanently recorded in the tooth enamel. In a longitudinal study, it would be simple, with a series of radiographs, to follow the process of tooth calcification.

SUMMARY AND CONCLUSIONS

A technique of obtaining intraoral radiographs in living cattle is presented. The method is relatively simple, inexpensive, and can be accomplished by persons of moderate skill.

Establishing the chronology of formation and calcification of incisor teeth will aid in the accurate determination of the exact age of an animal and could be of value in making certain diagnoses.

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Water Fluoridation (at 4 p.p.m.) Not Injurious to Man

An examination at necropsy of the bones of 69 persons, 26 to 90 years old, who had drunk water with 0.1 to 4.0 p.p.m. of fluoride for at least ten years, showed an increase in the fluoride content of the bone at the higher level but no histopathological changes (page 732-739).

A comparison at necropsy of two similar persons showed a skeletal content of 0.51 to 0.65 per cent fluoride in the dry, fat-free skeletal tissue of the one who had consumed drinking water containing 8 p.p.m. of fluoride for a long period, and only 0.06 to 0.09 per cent fluoride in the skeletal tissues of the person who had consumed nonfluoridized water.

There were no gross or systemic pathological findings, nor any evidence of impaired health due to the high fluoride content (page 741-746).—*Public Health Rep. (Aug., 1958)*.

Kanamycin and Staphylococcus

A new antibiotic, kanamycin, has a structure and antibacterial activity which parallel that of neomycin. It is predominantly bactericidal, particularly against Staphylococcus, *Escherichia coli*, Klebsiella, *Bacillus anthracis*, and a few other organisms. Virtually all anaerobic organisms are resistant.

Being poorly absorbed from the gastrointestinal tract, kanamycin may be useful in preparing for bowel surgery. It is rapidly absorbed after intramuscular injection and up to 80 per cent is then excreted in the urine in 24 hours—most of it in six to eight hours.

Doses of 0.25 to 1.0 Gm., given at eight-hour intervals to an adult, will sustain effective levels against most susceptible organisms.—*New England J. Med. (Aug. 14, 1958): 352.*

Nicarbazin and Bovine Coccidiosis

Groups of 3 calves, 2 to 3 weeks old, were given 1, 5, or 25 Gm. of nicarbazin per calf daily for 30 days and were inoculated with oocysts of *Eimeria bovis* on the second or third day of treatment. The low level of treatment was ineffective against the infection and the higher levels were toxic, as indicated by a loss of appetite, reduced rate of gain, and death of the 3 calves on the 25-Gm. level in 13, 19, and 25 days, respectively.

In a second experiment, similar calves did not benefit by treatment with nicarbazin, 7 to 27 Gm. per calf daily, from the thirteenth to fifteenth days after inoculation with oocysts. The toxicity of the drug was indicated by lesions in the kidneys at necropsy.—*D. M. Hammond et al. in Cornell Vet. (July, 1958)*: *260.*

Intra-articular Use of Prednisolone.—Prednisolone has only recently been prepared in a form suitable for intra-articular injection. To compare its effectiveness with hydrocortisone, 80 randomly selected

patients with acute rheumatoid arthritis of the knee or elbow joints were each given 25 mg. of either hydrocortisone or prednisolone acetate, and the effects were carefully recorded. As the drug effect wore off, the other steroid was injected. Six patients showed responses to prednisolone but not to hydrocortisone. Of the other patients, the response to prednisolone came 9.7 hours earlier (20.3 vs. 30.0), lasted 1.6 days longer (8.1 vs. 6.5), and caused increased joint pain in fewer (15 vs. 38) patients than did hydrocortisone.—*Brit. Med. J. (Aug. 2, 1958): 290.*

Antibiotic Toxicosis in Birds

When 43 pigeons were injected in the breast muscle with 0.2 cc. of a penicillin-streptomycin mixture, all of the birds experienced emesis in 30 to 60 minutes, but all recovered. In an experiment, acute toxicosis, characterized by ataxic and depressive stages, occurred in pigeons given, intramuscularly, 715 mg. of dihydrostreptomycin sulfate per kilogram of body weight. Opisthotonic spasms occurred in 2 pigeons given 2.5 million units/kg. of procaine penicillin G.

The signs of acute toxicosis from dihydrostreptomycin sulfate (2,116 mg./kg.) in chickens were similar to those in pigeons. Intramuscular injections of 40,000 units/kg., or more, of procaine penicillin G resulted in watery diarrhea in chickens.—*J. E. Gray et al. in Avian Dis. (May, 1958): 187.*

Bovine Quadruplets.—Two sets of quadruplet calves resulting from artificial insemination are reported in Michigan in 1958. Two female and 2 male Holstein-Friesian calves were born to a first-calf heifer, and 3 female and 1 male calves to an Aberdeen Angus cow. Quadruplets are estimated to occur approximately once in 19,000,000 births for dairy cattle, once in 750,000 births for beef cattle, and once in 670,000 births for man.—*A. I. Digest (Sept., 1958): 3.*

Environment and Heredity in Russia.—Soviet scientists at the International Genetic Congress in Montreal apparently reverted to the Lysenko theory, which they seemed to have deserted in recent years. They again seem to be advocating that heredity can be permanently altered by environmental effects. Scheduled speakers at the meetings were replaced by one who claimed that hybrid plants could be obtained by grafting and another who reported that transfusions of blood from gray ducks into white chickens resulted in inheritance of pigmented feathering of some of the progeny.—*Sci. News Letter (Sept. 6, 1958): 149.*

Medical Research in the Soviet Union.—During a visit to Russia, it was observed that every class of therapeutic compound developed by the West is in clinical use there. Although Soviet medical science lags quantitatively, it is qualitatively comparable with that of western science. It is suggested that the West pay more attention to the data and methods of Russian biological science.—*J. Am. M. A. (Aug. 23, 1958): 2120.*

British Kennel Club Ruling on Entire Dogs

British Kennel Club regulations prohibit the showing of dogs which are not entire and specifically prohibit ear-cropping and other alterations with the exception of tail-docking in some breeds and dewclaw removal.

The Committee of the Kennel Club has further ruled that the owner would be liable if any act is performed to make a dog appear normal and entire when in fact it was previously a monorchid or cryptorchid. Even if such alteration is done on advice of a veterinarian and in the best interests of the health and well-being of the dog, it is nevertheless considered an act to deceive and the dog would still be ineligible for exhibition under Kennel Club regulations.—*Vet. Rec. (May 3, 1958): 388.*

Correction—Work on Bovine Cesarotomies and Puerperal Septicemia in Sows Done in Belgium

In the July 15 issue of the JOURNAL (p. 110), in the item on "Bovine Cesarotomy Case Reports," it is reported erroneously that this work was done "at a clinic in Germany." Actually, the work was done at the University of Gent in Belgium but was published in a German journal. On page 112 of the same issue, the item on "Puerperal Septicemia in Sows" was reported as originating in Holland; however, it also was originated in Belgium but was published in a Dutch journal. We regret these errors and wish to give due credit to the University of Gent in Belgium.

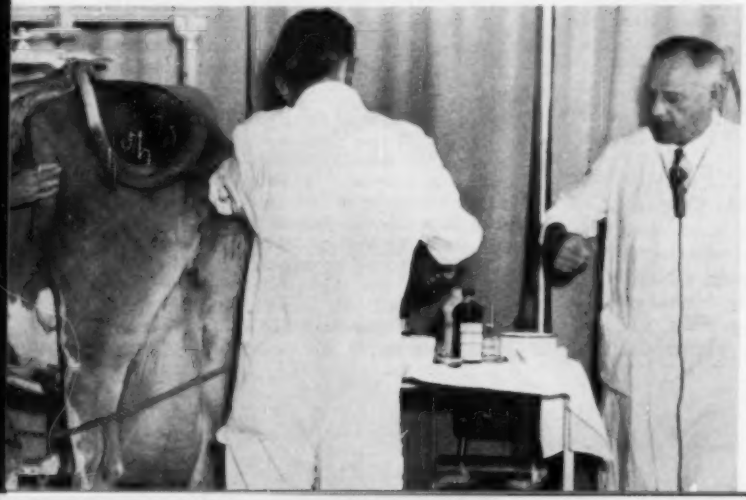
Behind the Scenes in Television at Philadelphia

Dr. R. W. Kirk, Ithaca, N.Y. (center), explains the technique for making canine electrocardiographic tracings. Assisting in the presentation is Dr. Les Fisher (right), TV coordinator.

Veterinarians who have seen only the television programs as they come over the viewers in the meeting rooms may be interested in the pictures on these pages illustrating the complicated equipment including cameras, cables, and other technical electronics which are needed to produce the closed circuit television at AVMA annual meetings.

An enormous amount of planning by the section officers and the local committee goes into the televised portions of the scientific programs each year, which are made possible by Allied Laboratories, Inc., in cooperation with Radio Corporation of America.

The smooth presentation of the televised program was due to the efforts of Dr. Les Fisher, Berwyn, Ill., the TV coordinator.



Dr. V. A. Carlson (left), Acton, Mass., demonstrates the Belgian modification of Minchev's operation for prolapse of the vagina in the cow. Narrating is Dr. Cornelius Thibeault, Wakefield, Mass.

Dr. C. R. Leahy (left), Whitney Point, N.Y., discusses foot troubles in cattle. At right is Dr. Les Fisher, TV coordinator.

A demonstration of the walking cast is given by Dr. L. E. Johnson (left), Columbus, Ohio, assisted by Dr. R. L. Rudy, also of Columbus.

Drs. R. W. Menges (right) and Mildred M. Galton, Atlanta, Ga., demonstrate the recent developments in laboratory diagnosis of leptospirosis, which is narrated by Dr. Ernest S. Tierkel (left), also of Atlanta.

Demonstrating a new instrument for obstetrical operations is Dr. T. L. Knapstein (left), Greenville, Wis. Dr. Quinton Metzig (center, left), of Oshkosh, Wis., narrates.

Drs. V. A. Carlson (left), Acton, Mass., and R. D. Hoffman, Bedford, Pa., illustrate the magnetic removal of foreign bodies from the reticulum of the cow by paracentesis.

Practical teat surgery is discussed by Dr. D. A. Wiley, Jarrettsville, Md.

Dr. V. L. Sanger (left), Wooster, Ohio, demonstrates the use of the spay hook in baby pig castration.

First aid treatment of fractures in large animals is presented by Dr. Jacques Jenny (right), Philadelphia, Pa., as Dr. W. O. Reed, Elmont, N.Y., narrates.

Intrauterine Treatment of Postparturient Cows with Chlortetracycline and Neomycin Sulfate

E. F. STULA, D.V.M.; W. N. PLASTRIDGE, Ph.D.; E. L. JUNGHERR, D.V.M.

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INFERTILITY IS one of the most important disease problems of cattle. The cause is complex and includes both noninfectious and infectious factors. The infectious cause may be a known contagious disease or a noncontagious metritis due to pyogenic bacteria.

That a high rate of uterine infections occurs in "normal" cows immediately following parturition was indicated[4] when uterine lochia were collected aseptically from clinically normal puerperal cows. It was found that these animals contracted a uterine infection with a frequency of 25 to 30 per cent. Of the cows with uterine infection, *Corynebacterium pyogenes* was isolated from 28.3 per cent, *Escherichia coli* from 26.7 per cent, staphylococci from 16.7 per cent, streptococci from 2 per cent, and mixed other bacteria from 25.0 per cent.

Judging from the obstetrical procedures carried out on an average farm, it is probable that a high rate of puerperal infection occurs in cows in this country. While the relation of these infections to infertility in clinically normal puerperal cows is not known, it seems reasonable to expect that they may contribute to the problem. If so, it follows that intrauterine treatment of postparturient cows might reduce the infertility rate.

An experiment was conducted to determine if postparturient uterine medication with chlortetracycline and neomycin sulfate would improve reproductive efficiency.

MATERIALS AND METHODS

Breeding data were collected for the years 1956 and 1957 from a dairy herd averaging about 80 cows. The herd was free from brucellosis and leptospirosis. Periodic tests for vibriosis indicated that the incidence of this disease was low. Most cows were bred artificially with streptomycin-treated semen.

It was the practice in this herd, both prior to and during the experiment, to infuse 1 Gm. of streptomycin in 25 ml. of sterile distilled water into the uteri of cows that returned to heat after three services. Cows with an off-cycle return to heat with fewer than three services were similarly treated.

Following calving, the cows were placed alternately in one of three groups. Those in group 1 were given 2 0.5-Gm. chlortetracycline tablets; those in group 2, 1 neomycin sulfate tablet, equivalent to 1.0 Gm. neomycin base; and those in group 3 (controls) were not treated. After washing the vulva with a germicidal solution of chlorhexidine diacetate (Nolvasan®), using a rubber sleeve and glove, the antibiotic was inserted deep into the uterus within 24 hours postpartum.

Cows with retained fetal membranes were given repeated doses of either the chlortetracycline or neomycin sulfate every 48 hours until the membranes came away without manual intervention, as had been suggested.[5]

TABLE 1—Number of Services and Calving Interval of Treated and Control Cows

Group	Intrauterine medication	No. of cows	No. of services to conceive			Calving interval (mo.)	
			1 to 2	3 or more	Av.	Range	Av.
1	Chlortetracycline	34	30	4	1.68	11.1-15.5	12.5
2	Neomycin sulfate	29	19	10	1.97	11.0-19.2	13.0
3	———	34	22	12	2.30	11.0-19.2	13.5

RESULTS

Services and Calving Interval.—The 34 cows treated with chlortetracycline required an average of 1.68 services to conceive and carry to term; the average calving interval was 12.5 months, with a range of 11.1 to 15.5 months. The 29 cows treated with neomycin sulfate required an average of 1.97 services to conceive and carry to term; the average calving interval was 13.0 months, with a range of 11.0 to 19.2

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months. The 34 control cows required an average of 2.30 services to conceive and carry to term; the average calving interval was 13.5 months, with a range of 11.0 to 19.2 months. The results are summarized (table 1).

Of the animals treated with chortetracycline, 30 of 34 cows (88%) conceived from one or two services, as compared with 22 of 34 (65%) in the control group. The difference in favor of the treated group is significant (P=0.02 by the chi-square test). The conception rate in the group treated with neomycin sulfate was not significantly different from that in the controls; 19 of 29 cows (67%) conceived from one or two services.

During the two years, 3 cows treated with chlortetracycline, 6 with neomycin sulfate, and 9 control cows were given intrauterine streptomycin infusions when they returned to heat after three services or after having an off-cycle return to heat.

Incidence of Retained Fetal Membranes and Sterility.—Of the 97 cows, 13 had retained fetal membranes. Of the 13 cows, 8 were treated with chlortetracycline and later conceived from an average of 2.5 services; 4 were treated with neomycin sulfate and later conceived from an average of 2.5 services, while the control cow conceived after three services.

During the two years of observation, 8 cows were sold for reasons attributed to infertility and were not included in the 97. Of the 8 cows, 3 had been given chlortetracycline; 2, neomycin sulfate; and 3 were in the control group.

DISCUSSION AND SUMMARY

Infection of the uterus with pyogenic bacteria following calving is common in "normal" cows.[4] It seems reasonable to expect this condition to impair the reproductive efficiency of cattle. Since intrauterine antibiotic therapy is useful in controlling infection associated with retained fetal membranes,[1-3] the effect of postpartum treatment on 97 cows in a dairy herd was investigated.

The results showed that 30 of 34 cows (88%) treated intrauterinely with chlortetracycline, 19 of 29 cows (67%) treated with neomycin sulfate, and 22 of 34 control cows (65%) conceived from one or two services. The difference in favor of the chlortetracycline treated group is significant (P = 0.02 by the chi-square test).

It appears that routine intrauterine medication with a broad-spectrum antibiotic, such as chlortetracycline, may reduce infertility due to postpartum infection in "normal" animals. The results indicate indirectly that postpartum infection in normal animals is a factor in infertility.

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Ovaries Transplanted in Different Strains of Mice.—Transplanted tissues grow if the host tissues contain all the histocompatibility antigens possessed by the donor. New methods of inducing tolerance have overcome such immunological barriers. Thus, ovaries from pigmented mice were transplanted into white mice. A week later, the female was mated with a white male and in four weeks a litter of 7 pigmented young was born. The female gave birth to two more litters at intervals of about four weeks, all pigmented.—*Nature (June 14, 1958): 1671.*

Value of a Second Insemination.—Using fresh semen, the first-service conception rate in 633 cows at the New Jersey Agricultural Experiment Station was 55.7 per cent; with a second service during the same estrus, 12 to 60 hours after the first, the conception rate in 173 cows was 56.1 per cent. With frozen semen, the comparable rates were 50.4 per cent and 52.7 per cent. Because of the small rate of increase, second breeding is not recommended on a herd-wide basis; it should be limited to cows with lower breeding efficiency.—*J. Dai. Sci. (July, 1958): 997.*

Effect of Relaxin on Normal Parturitions.—When tried on 47 parturient patients, relaxin failed to increase the softening of the cervix and to facilitate cervical dilatation in the course of normal labor.—*J. Am. M. A. (Aug. 16, 1958): 1910.*

Techniques of Collection and Transplantation of Ova in Farm Animals*

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IN THE FIELD of beef, dairy, and sheep production, it is recognized that genetic characteristics determine the quality and economic efficiency of animals. Artificial insemination has offered a means for the widespread distribution of desirable male genes via the sperm.

Similar genetic selection through high-quality females has, however, been limited since a cow will produce 1 calf per year, and the average number of offspring per female is about 5 in a lifetime. A marked increase in the production of offspring from performance-tested cows might be effected by superovulation, with transfer of the ova produced to less desirable host-mothers for development of the embryos.

The discussion to follow will deal with the techniques of collection and transplantation of ova in farm animals, with particular reference to recent and future trends.

HISTORICAL REVIEW

In 1776, an Italian physiologist, Lazzaro Spallanzani, reported the first successful experiments on artificial insemination, and also the effect of extreme low temperatures on semen. However, the large-scale application of artificial insemination did not start until ten years ago, and frozen semen until two years ago.

Ova transplantation has been successfully performed in the goat and sheep,[35] in the sheep,[19,23] and in the cow[37]—in all cases by surgical means. The technique is widely used in laboratory animals, especially the rabbit, in which considerable success has been achieved in terms of the survival of transferred eggs.[11]

The date of the first successful ova transplantation in each species is tabulated (table 1). In view of the rapid progress and recent advances in fundamental sciences, ova transplantation may soon be practical.

SUPEROVULATION IN THE DONORS

The male can produce several thousand to a few million sperm cells each day; the female only a few ova at each estrus. However, it is possible to obtain 50 to 60 ova from a cow or ewe at one estrus by the administration of gonadotropic hormones. The follicle-stimulating hormone (FSH) brings about the maturation of a number of follicles, while the luteinizing hormone (LH) causes ovulation. The FSH is usually injected subcutaneously; LH can be provided exogenously by intravenous injection or endogenously by timing the injection of FSH to have mature follicles present at estrus. The follicles are then ruptured by LH from the cow's own pituitary gland.

Several methods of producing superovulation have given satisfactory results. This includes a subcutaneous injection of pregnant mare serum during the middle of the cycle and, at the same time, expression of the corpus luteum.[5,11,17,18,29] The cow will come in heat two to four days later, usually the third day; she will then be inseminated or mated to a proved sire of high genetic make-up.

Superovulation is also attained by the injection of standard commerical preparations of gonadotrophic hormones.**

The ovum is 20,000 times larger than the sperm. The diameter and volume of ova vary a great deal among the different species of animals (table 2).

COLLECTION, EXAMINATION, AND STORAGE OF OVA

The ova can be collected from the living animal or from the donor female after slaughter.

Ova Collection at Slaughter.—The genital organs are obtained immediately after slaughter, the corpora lutea on each ovary are counted, and the oviducts removed with

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**Gonamone, produced by Fort Dodge Laboratories, Fort Dodge, Iowa.

part of the uterus. The oviducts are carefully dissected from the attached fat, using sterilized filter paper and blunted scissors, and transected at the uterine end. The oviduct is dampened from time to time with saline solution. The tube is flushed from the uterine end with saline solution. If the oviduct is overflushed, the fluid will run outside the oviduct and will be contaminated with fat droplets and blood cells. These, if mixed with the flushings, will mask the ova when examined under the microscope.

To collect the ova from the uterus by a similar procedure, the uterine horn is clamped or ligated at its middle and injected with the saline solution through the uterine wall on the ovarian side of the occlusion. In this case, the fertilized ova will be in the morula or blastocyst stage.

One may suspect that the flushings during transplantation may contain spermatozoa that could fertilize the recipient's own ova, but this is not the case. The collection of ova from the donor usually takes place at least 12 hours after mating or insemination of the donor and, by this time, the viability and fertilizability of the sperm have already declined and there is no risk of fertilizing the recipient's own ova.

TABLE 1—Dates of First Successful Ova Transplantations in Farm Animals

Species	Date	Author	Locality
Sheep, Goat	1949	Warwick and Berry	Texas, U.S.A.
Rabbit	1950	Dowling	Cambridge, England
Cattle	1951	Willett et al.	Wisconsin, U.S.A.
Pig	1951	Kvasnikii	U.S.S.R.

Ova Collection in Vivo.—With Surgery.—An incision, approximately 3 inches in length, is made through the flank of the donor. The uterus and ovaries are located and exposed and the number of ovulations recorded. The oviduct should not be clamped where it joins the uterus to avoid any adhesions, so that the donor can be used for subsequent ova collection.

TABLE 2—Size of Mature Ova of Animals Without Zona Pellucida*

Species	Diameter (μ)		Volume (million cμ)	
	Range	Mean	Range	Mean
Cow	95-158	125	0.47-2.06	1.00
Sheep	107-144	124	0.64-1.59	0.99
Rabbit	92-120	107	0.40-0.90	0.64

*Adapted from Kvasnikii.[21]

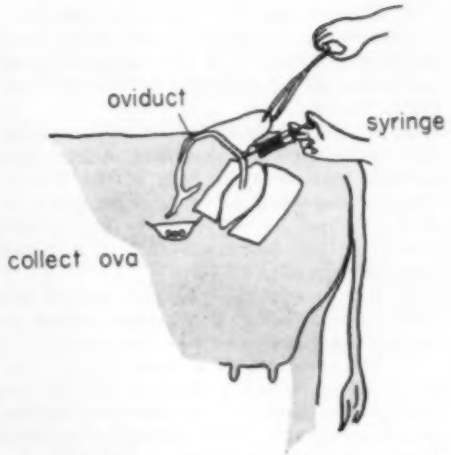

Fig. 1—Collection of ova from the superovulated donor by surgical operation. Sterile saline solution is injected into the oviduct near the uterine end and the ova are collected from the fimbriae in a sterile watch glass.

Sterile saline solution is injected into the oviduct near the uterine end, and the ova are collected from the fimbriae in a sterile watch glass or a test tube (fig. 1). The flow of flushings is directed toward the fimbriae since the uterotubal junction will be partly constricted. A small polyethylene tube (10 cm. in length and 3 mm. in outer diameter) can be inserted into the end of the oviduct for 1 cm. to facilitate the drainage of the flushings and to avoid losing the ova. The saline solution should be injected slowly.

Without Surgery.—A satisfactory instrument, consisting of a triple-lumen tube, has been developed for this purpose.[20] One lumen permits entrance of a steel rod to hold the tube rigid during insertion through the cervix.

The technique for flushing the ova using this instrument is simple providing these steps are followed closely:

1) When in heat, the cow is bred either naturally or artificially. Four days are required for the superovulated ova to travel down the oviduct into the uterus. It is known that the ovum attaches itself to the uterine wall on approximately the eleventh day; therefore, the morulae which float in the uterine cavity for seven days can be recovered by flushing the uterus on the sixth day after heat.

2) The cow may be tied in the stanchion or fastened more securely and all the fecal material removed from the rectum. This is facilitated by keeping the animal off feed for 12 hours.

3) With one arm in the rectum grasping the cervix, the tube is guided through the cervical folds into the body of the uterus, then to either side of the uterine horns. It is determined by palpation in the rectum when the tube has extended 1 or 2 inches into the horn of the uterus.

4) Air is admitted through one of the three lumina to inflate a rubber balloon so as to occlude the cavity of the uterus.

5) The steel stilette is then removed and blood serum diffused through the uterine cavity by injection through this lumen, which washes the ova through the third lumen into a sterile vessel.

A similar technique was reported in 1949.[12]

Microscopic Examination of Ova.— The freshly ovulated ova are not easy to distinguish under the microscope and often they are surrounded by cumulus cells. They should be examined in sterile saline solution in a watch glass. If air bubbles occur on the surface of the fluid, they should be broken with a heated probe so the ova can be seen underneath. If the ova still can not be seen, 0.1 Gm. of powdered hyaluronidase,† an enzyme, should be added to dissolve the debris around the ova.

With a needle, all the ova are moved toward the center and examined. Healthy ova are characterized by bright appearance of the protoplasmic material. In some of these ova, the protoplasm may have started to shrink. Such ova may or may not be suitable for transplantation. To get good results, only the healthy looking ova should be transplanted. Usually, the ova do not cleave at the same rate; one might find ova in the two- and four-cell stages in the same animal.

There are three types of ova which should not be selected for transplantation: (1) ova with more retarded cleavage than the average; (2) ova with irregular or uneven shaped blastomeres (7% of the ova); (3) ova with an odd number of blastomeres such as three, five, or seven (5 to 7% of the ova).

Storage of Ova.—To hold the eggs outside the body (*in vitro*) for a few minutes or for many hours, a satisfactory medium is essential. The following preparations have been used for successful transplantations: Kreb's solution for rabbits; phosphate buffered Ringer-Dale solution (containing 0.1 per cent glucose at pH 6.5 to 7.0 with an equal volume of fresh rabbit blood and then centrifuged) for rabbits; blood serum for swine; aqueous humor from sheep's eyes for sheep; physiological saline solution or Locke's solution for sheep; and homologous blood serum for cattle.

Viable rabbit ova in all stages up to the six-day blastocyst stage can be stored *in vitro* for several days at low temperatures.

The percentages of these ova which are capable of developing after transfer are equal to those obtained from transfer of freshly recovered eggs.[7,8,9] Cow ova could continue cleaving *in vitro* following the same treatment.[23] Attempts to deep freeze rabbit eggs failed[7] but a few continued cleavage after freezing in a glycerol containing serum medium.[32]

TRANSPLANTATION TECHNIQUE

The transplantation pipettes are easy to make. Draw a piece of glass tubing on a Bunsen burner. Fire polish the end of the pipette and autoclave in another glass case (fig. 2). Use each pipette only once.

Make an incision through the flank as before. Lay gauze sponges around the incision. Spray sterilized saline solution on gauze and pick up the adipose tissue attached to the oviduct. Leave the oviduct lying on the exterior of the abdominal cavity and cover it with dampened gauze sponges. Collect the ova from under the microscope and complete the transplantation as follows:

1) After careful examination, collect three healthy ova in a pipette and take them from the watch glass to the animal in the least possible amount of fluid. Make sure that there is some fluid on both sides of the ova in the pipette (fig. 3).

2) *In situ*, the fimbriae usually surround the ovary. To facilitate inserting the transplantation pipette into the oviduct, release the fimbriae gently from around the ovary.

3) Prior to insertion of the pipette in the oviduct, push out all of the air in front of the ova (fig. 4).

4) Insert the transplantation pipette ½ inch into the oviduct, manipulating the di-

†This enzyme is prepared from bovine testes and can be obtained from the Wyeth Institute for Medical Research, Philadelphia, Pa.

rection of the pipette according to the loops of the oviduct (fig. 5). When using the regular transplantation pipette, apply slight pressure with the fingers. To get better results, use a sharp-pointed Pasteur pipette connected by rubber tubing to a short metal micro-syringe.

5) After transplantation, replace the fimbriae around the ovary, then suture the flank incision.

6) After suturing the muscles, remove the subcutaneous fat before closing the skin. Use an aqueous penicillin spray between steps of suturing the flank wound. Leave the animal in quiet quarters.

DISCUSSION

Artificial insemination centers are located throughout the world. In similar fashion, we may have ova transplantation centers in the future. To establish such centers, it will require a culture room equipped with infrared lamps to raise the temperature to 37 C. and an ultraviolet lamp to keep a sterilized atmosphere. A regular binocular could be mounted in a glass top to prevent the exposure of ova to contamination while they are being examined.

Fertilized eggs can be transported long distances. Young rabbits were obtained from recipients in Cambridge, England, from donor rabbits in Shrewsbury, Mass.[25] The embryos were shipped by air in small tubes in a thermos flask.

Fertilized eggs could be transported in living rabbits. For instance, sheep ova could be injected in the uteri of living rabbits and the rabbits could be shipped by air from one hemisphere to another. Upon arrival at the destination, the rabbits would be slaughtered and the ova flushed from the uteri and transplanted into ewes.

The factors governing the efficiency of egg transfer can be conveniently listed under three headings as follows: (1) donor—viability and physiological potentiality of the egg; (2) recipient—ability to maintain a pregnancy; (3) miscellaneous—recovery, storage, and transfer medium; time elapsing between egg recovery and transfer; mechanics of the actual transfer; number of eggs transferred; site of transfer; synchronization of stage of egg development and luteal stage of recipient. These factors have been discussed.[1,2,37]

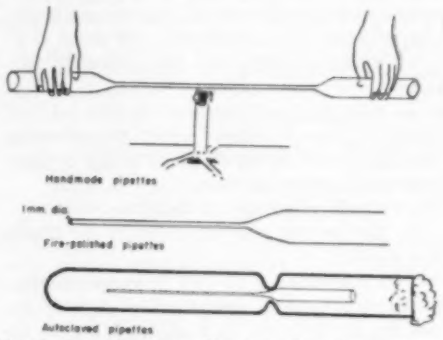

Fig. 2—Procedure for making transplantation pipettes.

Recommendations for practical application of ova transplantation techniques:

1) The developmental stage of the transplanted ova must correspond to the stage of estrous cycle of the recipient, *i.e.* transplant 2-day-old ova in recipients two days after ovulation time. Identify estrus in the recipients (cows or ewes) by the continuous use of vasectomized or aproned males; observe them daily. Do not mate or inseminate the recipient.

2) Have all glass equipment and instru-

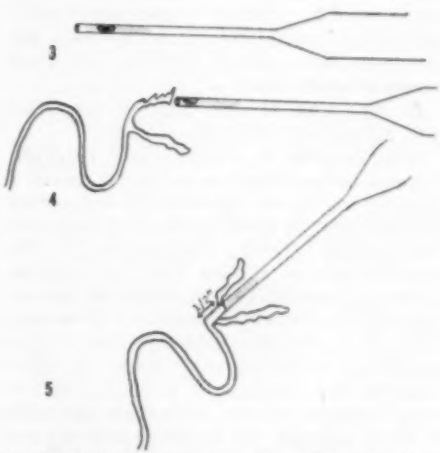

Fig. 3—Healthy ova are taken from the watch glass to the recipient animal in a sterile transplantation pipette. Fluid must surround the ova on all sides.

Fig. 4—Prior to insertion of the pipette into the oviduct, all air in front of the ova must be pushed out.

Fig. 5—Transplantation of the ova from the pipette into the oviduct; 1/200 ml. of saline solution should be kept in the pipette.

ments carefully sterilized. Use transplantation pipettes (fire polished) only once.

3) Avoid touching the oviducts with forceps.

4) Use minimal amount (1/100 ml.) of sterile saline solution when transferring the ova from the watch glass to the oviduct and when transplanting.

5) Avoid injecting air into the oviduct.

6) Do not use overfat animals for transplantation.

The Advantages of Ova Transplantation.—(1) The rate of progress in genetic improvement of cattle and sheep would be increased. Progress with dairy cattle could be 1.5 to 2.0 times that in which females are selected on the basis of their own performance and males on the basis of full-sister performance.[10]

2) Valuable females which produce normal ova but do not conceive, due to some endocrinological or anatomic defect, could be used as donors, but only if the defect were not hereditary.

3) Parent stock could be effectively progeny-tested at a fairly early age.

4) The development of inbred lines would be facilitated.

5) If fertilized ova could be procured from calves and transplanted to sexually mature recipients, the generation time of cattle could be reduced by one year. By the injection of gonadotrophic hormones it has been possible to obtain fertilized ova from calves a month old.[24]

6) It should become possible to obtain beef calves from dairy cows, etc.

With regard to fundamental research, the ova transplantation technique makes it possible for better experimental approaches for problems in the physiology of reproduction, animal breeding, and genetics. In this respect, several studies have been undertaken on hormonal requirement of implantation,[14] inhibitory mechanisms of implantation,[15] and superfetation.[16] The oxygen uptake of fertilized ova[13] could be correlated to survivability of transplanted ova.

In most studies on embryonic mortality in farm animals, the losses during the gestation period have been estimated by comparing the number of living fetuses with the number of corpora lutea. However, in some species, e.g. the mink, it has been shown that ripe follicles may not burst, but develop to functional corpora lutea. Therefore, it is believed that more exact data would be achieved by transferring a certain number of fertilized ova to recipients which have been synchronized to the sexual stage corresponding to the age of the ova. After a number of days, the recipients could be examined and the number of surviving fetuses counted.

Limitations to Practical Application of Ova Transplantation.—Two limitations for the development of ova transplantation to a stage comparable to artificial insemination are: (1) the synchronization of the estrous cycle of the recipient and donor, which requires further fundamental research in hormone therapy, and (2) the prevention of pyometra as a result of transplantation *per vaginum*.

Synchronization of the estrous cycles of donor and recipient may be facilitated by altering the estrous cycle of the recipient with progesterone.[34] Ewes treated in this way were normal in fertility.[6,27] A fairly satisfactory conception rate has been recorded in heifers inseminated at the first heat following administration of this hormone.[36]

The results of ova transplantation through the vagina and cervix were unsatisfactory due to the susceptibility of the uterus to infection during the luteal phase of the estrous cycle[4,21] and to the development of pyometra.[22]

A similar condition was observed when semen was deposited in the uterus when an active corpus luteum was present, as reported in the cow,[5,29,39] sow,[33] and rabbit.[3,29] Antibacterial agents in the diluted semen eliminate or reduce the severity of the metritis. These results with antibiotics suggest that ways may be found to avoid infection when transplanting eggs into the uterus *per vaginum*.

Attempts to overcome this difficulty were made[22] by embedding tubal eggs in gelatin in a small cup at one end of a small glass dart and, by means of a long tube and plunger, inserting the dart into the ovarian ligament close to the ovary. This was done by passing the tube through the vagina and cervix, into the uterus, through the uterine wall and into the abdominal cavity, and then plunging the dart into the ovarian ligament. Barbs on the dart retained it in position. The gelatin melted and liberated the egg.

A nonsurgical operation of this nature would be done shortly after estrus and can

be done quickly. The disadvantage of this procedure is that tubal eggs must be used.

SUMMARY

1) The transplantation of fertilized ova from superovulated donor females of the large animal species to inferior females of the same species may become a practical, commonly used procedure.

2) Several methods and techniques for the transplantation of ova in cattle and sheep are described and discussed.

3) For the practical application of ova transplantation, research work is needed for the synchronization of ovulation in relation to estrus and on antibiotic administration to combat pyometra resulting from ova transplantation *per vaginum*.

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Ovum Transfer in Sheep.—Transfers were made of 120 fertilized ova to 91 ewes. They were most successful when estrus was synchronized between the donor and the recipient. Some transfers were successful after the fertilized ova had been stored at 30 to 37 C. for up to 115 minutes. The highest percentage were successful when the ova were at the six- to 16-cell stage. None of the two-cell ova and only 15.8 per cent of the four-cell ova developed when transferred into the uterine horn, and none of either two- or four-cell ova developed when transferred into the uterine tubes of ewes in which estrus had begun more than three days previously. Success was not related to the breed or season. Of 13 ewes in which transfers failed, 12 conceived when mated at the first or second following estrus.—*Vet. Bull. (Aug., 1958): Item 2666.*

Mammary Edema in Cows

Mammary edema near the time of parturition occurs in certain species. It is more frequent in heifers than in cows and is most apparent in the subcutaneous tissues anterior to and in the udder. The edema parallels a drop in serum protein level of the blood.

Experimental attempts, at the University of Illinois, to treat this edema by injections of solutions, such as serum albumin, to raise the blood osmotic pressure were not without dangers and too costly to be practical.—*J. Dai. Sci. (July, 1958): 995.*

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Effect of Feeding on Udder Edema.—Heavy grain feeding before calving, at the University of Illinois, resulted in no increase in the yield of milk during the first 84 days of lactation. These cows and heifers made greater increases in live weight, but no increases in the instance or severity of mammary edema at calving time. There was more udder edema in heifers than in older cows.—*J. Dai. Sci (June, 1958): 822.*

Thoracic and Abdominal Arrow Wound in the Cat

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On April 21, 1958, a 1-year-old male domestic cat was brought to the small animal clinic, Colorado State University, for examination and treatment. The owner stated that the cat had been shot with an arrow the previous day and had disappeared until the day of entry. Additional history revealed the cat would not eat or drink and would cry in pain when picked up.

Examination disclosed an arrow in the abdominal cavity. The point of entry was ventral and medial to the point of the right shoulder (fig. 1). The point of the arrow, after traversing the thoracic and abdominal cavities, lodged subcutaneously lateral to the base of the tail.

Further examination revealed subcutaneous emphysema in the right thoracic area and a laceration at the point of entry. The cat showed marked depression, pain, and had a temperature of 104 F.

Radiographs, lateral and dorsoventral views, showed the arrow lying mainly in the abdominal cavity to the left of the median plane (fig. 2). The arrow was shown extending from the ventral border of the left sternal portion of the diaphragm, posteriorly through the pelvis (fig. 3). Radiographs also revealed a fractured right fifth rib near the costochondral junction. There was some congestion of the ventral portion of the lungs.

SURGICAL PROCEDURE AND RESULTS

A blood coagulant (3 ml.) was administered intramuscularly prior to surgery. Thiamylal sodium (Surital Sodium*) was

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*Surital Sodium is produced by Parke, Davis & Co., Detroit, Mich.

Fig. 1—Photograph of a cat, showing the point of entry of an arrow.

Fig. 2—Radiograph, lateral view, showing arrow in the abdominal cavity of a cat; arrow superimposed on radiograph.

Fig. 3—Radiograph, dorsoventral view, showing arrow in the abdominal cavity of a cat; arrow superimposed on radiograph to show its position.

Fig. 4—Photograph of the cat, seven days after surgery for removal of an arrow.

used for general anesthesia. A 1-inch incision was made just over the point of the arrow in the perineal region and the arrow was easily removed with forceps. Minimal hemorrhage was encountered, but 90 ml. of whole blood was given during surgery for prevention of shock.

Immediately after surgery, the cat had a weak heartbeat and a rapid, thready pulse. At this time, 25 ml. of 50 per cent glucose containing 5 I.U. of ACTH was administered intravenously. To relieve marked cyanosis and dyspnea, oxygen was given at the rate of 2 liters per minute for one hour. The cat recovered fully from the anesthesia in two hours.

The cat was given 200,000 units of procaine penicillin and 0.12 Gm. of dihydrostreptomycin daily for seven days. The day following surgery, the cat was alert but quiet, reluctant to move, and had a temperature of 102.6 F. It consumed a small amount of warm milk and solid food. Four days later, the temperature, appetite, and bowel movements were normal. One week postoperatively, the cat was discharged without evident complications (fig. 4).

Clinical Data

Studies on Urolithiasis. II. The Occurrence in Feedlot Lambs Following Implantations of Diethylstilbestrol

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THE INTRODUCTION of new concepts of feeding for growth in domestic animals must be accompanied by an assessment of both the desirable and undesirable effects. The stimulation of growth by oral or parenteral hormones or their synthetic analogs in cattle and sheep needs no documentation and is for the most part clear-cut and profitable. A recognition of the deleterious sequellae is necessary for, with knowledge of the problems that may arise, preventive steps may be taken.

The occurrence of altered physiological growth is recognized and has been objectively studied as part of a number of trials. For convenience, these physiological changes can be summarized into two general groups: (1) those with little effect on the economic value of the animal, and (2) those which profoundly alter the economic value.

Among the former are hyperplasia of the mammary glands, adrenals, and pituitary gland, and hypertrophy of the secondary sex glands of the castrated male. Among the latter are prolapses of either the vagina or the rectum, and obstruction of the urinary tract.

Investigators[1] have reported highly significant enlargements of the length and width of bulbourethral glands, seminal vesicles, urinary bladders, ampullae, urethras, and prostates of wethers implanted with 15 mg. of stilbestrol twice at a 70-day interval. They reported that during the first part of the feeding trial there was a loss of 5 animals with signs of urinary calculi—4 from the group given the double implant, and 1 from the group given a single implant.

The authors reported an additional loss of 8 lambs given two implants from prolapse of the rectum or from conditions resulting in excessive swelling of the perineal region.

Others[2] have reported two instances of urolithiasis in animals implanted with 10 mg. of estradiol. They also observed mammary hyperplasia in males and females, and enlargement of the secondary sex glands of wethers.

Two field studies were reported[3] of lambs implanted with 12 mg. of diethylstilbestrol in which there was a loss of 2,000 (22%) of 9,000 animals in the first flock and a 10 per cent loss among 3,500 in the second. In the first, the primary cause of death was reported to be a blockage of the urinary tract from inflammation, although few calculous stones were found. In the second, the cause of death was reported to be prolapse of the rectum.

MATERIALS AND METHODS

On Feb. 10, 1957, when 450 shorn wether lambs entered the feedlot, 300 were implanted in the ear with two 15-mg. stilbestrol pellets, of the type ordinarily used for caponizing cockerels, and the remaining 150 were untreated. Each animal was identified and all were fed in a single lot with about 900 other lambs.

The feed was composed of milo (1,600 lb.), dehydrated alfalfa hay (100 lb.), molasses (207 lb.), limestone (30 lb.), bone meal (70 lb.), sodium chloride (20 lb.), a trace mineral mixture (10 lb.), and oxytetracycline (Terramycin 10*) (3 lb.). This mixture was pelleted and available to the lambs continuously in self-feeders.

In addition, alfalfa hay was fed daily and either corn silage or wet beet pulp was fed on alternate days. A mineral supplement of equal parts of sodium chloride, bone meal, and calcium carbonate was available, and about 100 lb. of this mixture was consumed daily by the 1,500 lambs in the lot. Good-quality water was available at all times.

RESULTS

After ten days in the feedlot, the owner reported the first appearance of swelling indicative of "waterbelly." Several visits were made to the feedlot and approximately

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*Terramycin 10 is produced by Charles Pfizer & Co., Terre Haute, Ind.

20 dead or sick lambs were necropsied and the entire urinary tracts were examined.

The subcutaneous swelling (fig. 1) was due to extensive infiltrations of urine from ruptures of the urethra distal to the ischial arch. In most cases, the urethral process was occluded by impacted crystals (fig. 2). Only a few stones were found in the bladders. The sick animals in the lot were easily identified by the large subcutaneous swellings beneath the abdomens and the depressed appearances.

About the middle of March, the owner reported a total loss of approximately 60 of the 300 implanted lambs. The remainder of the implanted and 150 nonimplanted lambs were slaughtered at that time and showed no evidence of calculosis.

DISCUSSION

The implantation of stilbestrol clearly predisposed lambs to urinary calculi. Clinical cases of urinary obstruction occurred after only ten days on feed. Calculi were not abundant and were located in the urethral processes. The majority of cases of urinary calculi in lambs occur after several weeks on feed during cold weather, and a precipitate occurs in the urinary bladder as well as in the urethral processes.

Fig. 1—Abdominal wall infiltrated with urine from urinary obstruction and rupture of urethra following implantation with diethylstilbestrol in a feedlot lamb.

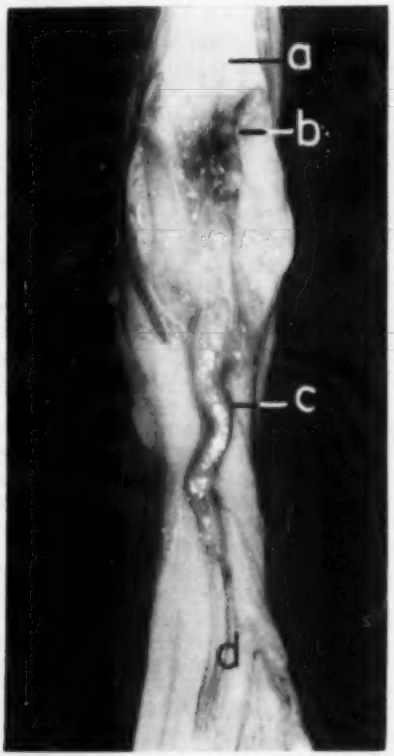

Fig. 2—Glans penis and prepuce of a feedlot lamb affected with urinary calculi: urethra opened longitudinally (a); focus of urethritis (b); urethral process dilated and obstructed with precipitate (c); and prepuce opened longitudinally (d).

The postulated causes of urinary calculi have been discussed and summarized elsewhere.[4] Some endocrine disturbances may result in urolithiasis. Parathyroid dysfunction has been established as one cause for an excessively high rate of mineral excretion and the formation of urinary calculi. Implantation of diethylstilbestrol stimulates anabolism, as indicated by an increased rate of growth, and may possibly alter metabolism and urine composition and predispose to urolithiasis.

SUMMARY

Sixty (20%) of 300 feedlot wether lambs died of urolithiasis within 35 days after they were implanted with 30 mg. of stilbestrol. None of 150 untreated control lambs was affected.

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Spinal Lymphosarcoma in a Bull

An adult Holstein-Friesian bull, used for artificial insemination, which had a number of small abscesses in various places a few months earlier, developed an incoordination and inability to mount a cow. There was a loss of sensation and control in the tail, but no fever. Small, nonsensitive masses in the pelvis and a large mass in the abdomen could be palpated. Urine was expelled frequently and the bladder lacked tone.

When slaughtered, a tumor was found invading the spinal column, and many large peritoneal tumors, identified as lymphosarcomas, were present. Several other cases of spinal lymphosarcoma have been seen at the Ontario Veterinary College.—*J. Thomson and C. A. V. Barker, in Canad. J. Comp. Med. (Aug., 1958): 280.*

Induced Shipping Fever Complex.—In efforts to produce shipping fever in cattle, inoculation with *Pasteurella multocida*, types A, B, and C, seldom produced a febrile reaction. When animals were chased around a pasture for half an hour and given a cold shower before inoculation, they showed a fever of 105 or 106 F. in about 48 hours and a slight diarrhea, but no other signs of illness. When 5 animals so treated were then injected with cortisone, the fever was more prolonged and 2 died after 21 days, with severe pneumonia. Organisms of the type injected were recovered from their tissues.

In Asia and Africa, pasteurellosis is a true septicemic disease; in North America it is not. Likewise, Newcastle disease is much more severe in other countries. These differences may depend on nutrition, environment, or other unknown factors.—*S. K. Sinha in Calif. Vet. (July-Aug., 1958): 20.*

So-Called "Edema Disease" of Pigs

Beta hemolytic coliform organisms isolated from the small intestine and mesenteric lymph nodes of pigs with edema disease were more often pathogenic and toxic than were coliform organisms from normal pigs.

Of 17 pigs inoculated intravenously or intraperitoneally with cultures of such organisms, 6 died. Five of these pigs died eight to 15 hours after inoculation. The sixth pig did not become sick until the fourth day, when it developed the syndrome and lesions of edema disease (enterotoxemia).

Endotoxins extracted from coliform organisms were tested for toxicity by intravenous injection into pigs. All extracts produced shock, but 9 pigs injected with endotoxins from cultures of normal pigs recovered. When extracts of cultures from animals with this disease were injected into 23 pigs, 12 died in seven to 12 hours.—*A. M. Rastegaeva, in Veterinariya (July, 1958): 25.*—ROBERT E. HABEL.

The Edema Disease Syndrome.—Reports on the clinical signs, lesions, and presumed causes of edema disease are sometimes contradictory. "Edema disease" is apparently a collective term for all conditions of unknown cause in which edema occurs. Thus, the diseases with which it can be confused include sudden heart death disease, and certain gastroenterites and dysenteries.

In edema disease, there are degenerative changes in the skeletal and heart muscles similar to those of sudden heart death. It usually affects well-nourished pigs and shoats—seldom lean pigs or sows. All of these diseases usually occur when there is a change to a more concentrated ration, such as at weaning.

Dietary measures, such as saline laxatives and fasting, are important in treatment.

Edema disease is not easily transmitted, the causative organism is not definitely established, and it is not certain that it is a new entity in swine.—*K. Börger in Berlin. u. Münch. Tierärztl. Wchnschr. (Aug. 15, 1958): 317.*

Laboratory Studies of Anaplasmosis in Cattle Treated with Oxytetracycline

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THE APPLICATION of the broad-spectrum antibiotic, oxytetracycline (Terramycin*), in the treatment of anaplasmosis has been reported by several investigators.[1,2,4,6,7] In the present study, hematological signs of the disease in 47 cattle, on two plantations in Mississippi, were compared before and after treatment with this drug.

Initially, studies were made of blood samples from 127 cattle, with positive diagnosis of anaplasmosis. Of the 47 treated with oxytetracycline, 2 died within 24 hours after treatment, and 21 of the untreated animals died within one week after testing. Epizootic anaplasmosis was suspected in these herds because many of the animals were weak, anemic with marked icterus, elevated temperatures, inappetence, and depression with dehydration. New cases were occurring daily.

MATERIALS AND METHODS

Inasmuch as there was no certainty as to the phase of infection, the animals were screened for typical hematological signs. For erythrocyte studies, the Leitz colorimetric determination of hemoglobin,[5] the Wintrobe hematocrit technique,[3] and the Wright stained blood smear[3] were used.

A few erythrocyte counts were made, but this procedure eventually was discontinued because of the shortage of time. Smears were examined for evidence and percentages of parasitized cells, general morphology, and cell description. In most cases, a differential leukocyte count was made, as well as a total count. In all cases, plasma was examined grossly for icterus and hemoglobinemia.

Initial findings did not in all cases present the complete blood picture considered typical of anaplasmosis. Some smears showed parasitized cells and no leukocytosis or hemoglobinemia. It was assumed that these inconsistencies were due to varying stages of the disease.

Moreover, it is possible that increased erythrocyte destruction may occur without detectable icterus or hemoglobinemia, provided the liver is capable of excreting excess pigment as fast as it is formed and the blood generating tissue is capable of producing new cells as fast as they are destroyed.

Of 116 cattle from plantation 1, 27 showed hemoglobinemia and 11 of the 27 showed leukocytosis also. Of the 11 animals from plantation 2, none showed these signs, although 60 per cent of the cells were found to be parasitized in most of the animals. Of these 11, 8 showed abnormally low erythrocyte counts and hemoglobin and 3 showed leukocytosis also. Blood smears from cattle of both groups generally showed polychromatophilia, reticulocytosis, and an increase in immature red and white blood cells, and approximately 75 per cent showed icterus or evidence of hemolysis in the plasma.

Because of prevalence of inconsistencies in the blood picture, it was decided to test the effect of treatment with oxytetracycline in 47 cattle showing reduced hemoglobin and reduced hematocrit readings; 41 were from plantation 1 and 6 from plantation 2. One to 3 mg. of the drug per pound of body weight was given to each of the selected animals, intramuscularly, intravenously, or subcutaneously. Approximately 72 hours later, blood samples were drawn for study. The same laboratory procedures were used as for the initial blood sample study.

RESULTS AND DISCUSSION

Two of the treated animals died. The results with the remaining treated animals are shown individually (table 1). These data were gathered without knowing the exact stage of the infection in the individual animals. The findings should be considered as observations from a clinical standpoint under field conditions supported by laboratory studies. There seems to be no relationship between the route of administration and the magnitude of response, but the data are too limited for conclusions.

The percentages of response to the respective dosage levels, when all data are

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*Terramycin, product of Chas. Pfizer & Co., Terre Haute, Ind.

combined without reference to mode of administration, are shown (table 2). Some trend toward higher values in both erythrocyte volume and hemoglobin is seen with increasing dosages of oxytetracycline, but it can be seen that doses as low as 1 mg. per pound of body weight gave a 33.9 per cent average increase in erythrocyte volume (hematocrit reading), and a 36.8 per cent average increase in grams of hemoglobin.

The leukocyte counts provided no significant information nor did the plasma hemolysis or icterus index. In blood smears, reduction in number of nucleated red cells and reduction in the number of immature leukocytes indicated active erythrocyte production.

Approximately a 25 per cent abortion rate had occurred for a period of three weeks in these two herds of cattle at various stages of pregnancy. These abortions subsided completely within a week after oxytetracycline treatment.

These herds were observed for ten weeks after initial treatment and, in some cases, treatment was repeated because weakness persisted. Since none of the calves were removed from these cattle, weakness may have been aggravated by nursing.

TABLE 1—Effect of Oxytetracycline on Erythrocyte Volume and Hemoglobin in Cattle with Anaplasmosis

Cow No.	Route adm.	R.B.C. vol. (%) Before treatment	After treatment	Change (%)	Hb (Gm./100 cc.) Before treatment	After treatment	Change (%)
		1 mg. per lb. body weight					
144	i.v.	19	23	+ 21.0	4.8	7.0	+ 46.0
290	i.v.	20	27	+ 35.0	6.0	7.8	+ 30.0
268	i.v.	22	39	+ 77.3	6.2	10.8	+ 74.2
212	i.v.	22	21	− 4.5	6.2	6.8	+ 19.7
150	s.c.	24	37	+ 54.2	6.2	12.2	+ 96.8
125	i.m.	15	29	+ 93.3	7.0	8.6	+ 22.9
60	i.m.	28	30	+ 7.1	7.0	9.2	+ 31.4
17	i.v.	24	31	+ 29.2	7.25	10.2	+ 40.7
40	i.m.	26	26	0.0	7.55	8.6	+ 13.9
288	i.v.	35	37	+ 5.7	8.6	11.2	+ 30.2
00	i.v.	34	34	0.0	9.2	10.5	+ 14.1
206	s.c.	36	35	− 2.8	9.2	11.5	+ 25.0
182	i.v.	37	39	+ 5.4	9.8	14.1	+ 43.9
273	i.v.	41	42	+ 2.4	10.8	13.7	+ 26.9
44	i.m.	26	37	+ 42.3	11.55	10.5	− 9.1
139	i.v.	37	31	− 16.2	11.9	10.2	− 14.3
113	i.m.	34	15	− 55.9	12.6	3.5	− 72.2
		2 mg. per lb. body weight					
266	i.v.	16	20	+ 25.0	4.15	6.55	+ 57.8
234	i.v.	20	38	+ 90.0	4.8	12.6	+162.5
38	s.c.	24	28	+ 16.7	6.5	7.55	+ 16.2
197	i.m.	26	17	− 34.6	6.5	6.2	− 4.6
1	i.m.	22	28	+ 27.3	8.35	7.55	− 9.6
39	s.c.	40	35	+ 12.5	8.35	9.8	+ 17.4
37	i.m.	31	33	+ 6.5	8.6	8.95	+ 4.1
15	s.c.	30	33	+ 10.0	9.2	10.5	+ 14.1
256	i.v.	35	37	+ 5.7	9.2	12.6	+ 37.0
78	s.c.	33	38	+ 15.2	9.8	10.2	+ 4.1
102	s.c.	34	38	+ 11.8	9.8	10.5	+ 7.1
260	s.c.	32	37	+ 15.6	10.2	11.9	+ 16.7
177	s.c.	38	41	+ 7.9	10.5	13.7	+ 30.5
178	i.v.	36	38	− 5.6	11.2	10.8	− 3.6
233	s.c.	42	40	− 5.0	11.2	12.2	+ 8.9
106	i.v.	40	17	+ 57.5	13.0	5.05	+ 61.2
		3 mg. per lb. body weight					
119	i.v.	12	15	+ 25.0	1.8	3.3	+ 83.3
679	i.v.	11	17	+ 54.5	2.4	3.5	+ 45.8
438	i.v.	10	24	+140.0	3.7	6.0	+ 62.2
281	s.c.	14	32	+128.6	3.7	10.8	+191.8
278-A	i.v.	14	29	+107.1	3.9	7.28	+ 86.7
11	i.m.	18	24	+ 33.3	4.15	8.3	+100.0
631	i.m.	17	17	0.0	4.8	3.9	− 18.8
527	i.m.	18	25	+ 38.9	5.05	6.0	+ 18.8
311	i.v.	19	28	+ 47.4	5.05	7.8	+ 54.5
328	i.v.	18	25	+ 38.9	5.8	8.05	+ 38.7
278	i.v.	24	17	− 29.2	6.8	4.4	− 35.3
22	i.m.	29	25	− 13.8	7.25	8.6	+ 18.6
439	i.v.	35	37	+ 12.1	10.2	10.8	+ 5.9
232	i.m.	40	22	− 45.0	11.5	7.25	− 37.0

TABLE 2—Effect of Oxytetracycline Dosage on Erythrocyte Volume and Hemoglobin of Cattle with Anaplamosis (Combined Data for all Routes)

Dose (mg./lb.)	No. of animals	R.B.C. volume No. of responses	R.B.C. volume Av. response	Hemoglobin No. of responses	Hemoglobin Av. response
1	17	11	33.9 (2.4-93.0)*	14	36.8 (13.9-96.8)
2	16	12	19.8 (5.6-90.0)	12	31.4 (4.1-162.5)
3	14	10	62.6 (25.0-140.0)	11	64.2 (5.9-191.8)

*Figures in parentheses show the range of response.

CONCLUSIONS AND SUMMARY

In two herds in which epizootic anaplasmosis was suspected, 47 animals were selected for treatment on the basis of low erythrocyte volumes and low hemoglobin levels.

Single graded doses of oxytetracycline (1, 2, or 3 mg./lb. body wt.) were administered intramuscularly, intravenously, or subcutaneously. Treatment resulted in an increased erythrocyte volume in 62 per cent of the animals and increased hemoglobin in 42 per cent. The most noticeable responses to therapy were in cattle with extremely low hemoglobin and hematocrit values.

Clinically, this therapeutic response was accompanied by reduction in numbers of marginal bodies and effective production of erythrocytes. Only two deaths occurred in treated animals and the abortion rate was reduced.

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Inhalation Treatment of Chronic Respiratory Disease in Chickens: Controlled Field Studies with Furazolidone and Dihydrostreptomycin Dusts

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IT IS NOW common practice to treat chronic respiratory disease (CRD) in chickens with medicated dusts. After nearly two years of extensive use of dihydrostreptomycin dust, the general consensus is that results seem favorable if treatment is given early in the course of the disease, but proof with critical comparative data is lacking. In the fall of 1957, a dust preparation of nitrofuran-furazolidone (Furoxone Aerodust*) became available for similar use. The method of its administration is simple and it is inexpensive.

This paper reports a controlled field study of the use of dihydrostreptomycin and furazolidone in dust forms in an attempt to reduce the morbidity and mortality associated with CRD in chickens.

FIELD TRIALS

Field Trail 1.—Diagnosis of CRD in a flock of 3,800 chickens, 5 weeks old, was based on the history and the clinical and pathological findings. Attempts to isolate a virus from the affected birds were unsuccessful.

The birds had been debeaked and vaccinated against infectious bronchitis and Newcastle disease (intraocularly) at 1 week of age, against Newcastle disease B-1 (Blackburg) strain (by spray) at 28 days, and against laryngotracheitis the next day. They were housed in three pens of equal size, separated by solid plywood partitions to prevent diffusion of medicated dust between pens. The sex ratio and average weight were approximately equal in each group.

When the chickens were 40 days old, birds in pen 1 were dusted with dihydrostreptomycin (Dihydro-Dust**) and those in pen 2 with the furazolidone preparation, while birds in pen 3, which seemed the least affected with CRD, were kept as controls. The birds were dusted at night as they were roosting, the medicated dust being released about 6 ft. from the nearest birds, and about 2 ft. over their heads, using a commercial duster.† Treatment was repeated in 48 hours.

A constant record of feed consumption was kept, and all birds that died in the next four weeks were necropsied. At the completion of the experiment, all birds were weighed.

Field Trial 2.—A diagnosis of CRD was similarly made in a flock of 1,800 chickens, 38 days old. Attempts to isolate a virus failed. The birds had been debeaked and vaccinated against infectious bronchitis and Newcastle disease (intraocularly) at 1 week of age, and against Newcastle disease (spray) at 4 weeks of age. The methods of handling, treatment, and observation were similar to those in trial 1.

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*Furoxone Aerodust, a product of Eaton Laboratories, Norwich, N.Y., containing 25 per cent micronized Furoxone, brand of furazolidone, in an excipient of finely powdered inert carrier.
**Dihydro-Dust, sold by Delaware Poultry Laboratories, Millsboro, Del., containing dihydrostreptomycin sulfate.
†Hudson Admiral Duster No. 766, made by H. D. Hudson Manufacturing Co., Chicago, Ill.

Body weights were computed on the basis of 100 birds from each group.

RESULTS AND DISCUSSION

The results of the two trials are summarized (tables 1 and 2). In both flocks, mortality and the number of culls were highest in the untreated control birds, which also showed the poorest feed conversion and lowest average weight gain. The mortality rates in the birds treated with dihydrostreptomycin and furazolidone were approximately equal, but the latter showed consistently better feed conversion ratios.

TABLE 1—Effect of Treatment with Furazolidone or Dihydrostreptomycin Dust on Chronic Respiratory Disease (CRD) Morbidity and Mortality in Chickens (Trial 1)

Group	Treatment	No. birds	Total deaths (No.)	Total deaths (%)	Death due to CRD	Total culls (No.)	Total culls (%)	Final weight (lb.)	Av. feed conversion ratio
1	Furazolidone dust	1,232	13	1.1	2	5	0.4	3.22	2:69
2	Dihydrostreptomycin dust	1,229	17	1.3	4	7	0.6	3.26	2:71
3	Untreated controls	1,229	97	7.9	69	45	3.7	3.05	2:99

Since the furazolidone preparation remains suspended in the air for considerably longer than the dihydrostreptomycin dust, the better results with furazolidone may be due in part to the longer exposure of the birds to this drug. In our experience with CRD, the efficacy of furazolidone dust has been much greater when used early in the course of the disease. Possibly the caseous lesions, which occur in the later stages of CRD, interfere with drug absorption.

Treatment with both furazolidone and dihydrostreptomycin was reported to increase significantly the survival time of chicken embryos inoculated with a pleuropneumonia-like organism (PPLO) strain isolated from cases of CRD;[14] furazolidone and streptomycin also were found to kill *in vitro* an avian strain of PPLO at the low concentration of 0.01 mg. per milliliter.[4] Streptomycin or dihydrostreptomycin has been found of some value in treating birds with CRD in experimental and field trials.[5,6,12]

Furazolidone was superior to streptomycin for the treatment of infectious sinusitis of turkeys,[9] which is closely related to CRD.[12] The nitrofuran was also found to be of value, in field and laboratory trials on large numbers of birds, for the treatment of infectious synovitis.[3] In experimental therapy of CRD, it exerted some inhibitory influence on the course and the severity of the disease when given in the feed.[7,11]

In view of the important effect of secondary bacterial invaders,[1] particularly *Escherichia coli*,[5] on CRD morbidity and mortality, the therapeutic efficacy of drugs bactericidal to such organisms was to be expected. Furazolidone was reported to be highly inhibitory to gram-negative organisms.[5,10,15]

It was more effective than any of the five antibiotics tested for *in vitro* inhibition of presumably pathogenic bacteria isolated from birds with CRD: furazolidone was effective against 50 out of 55 strains tested; chlortetracycline, the next most effective drug, inhibited only 41 out of 56, and dihydrostreptomycin only 19 out of 56.[2] Furazolidone-medicated feed may also be of value in infectious avian hepatitis, a disease presumably due to a large virus.[13]

Inhalation treatment seems to compare favorably in simplicity, cost, and effectiveness not only with individual therapy of each bird but also with medicated feeds, especially since feed consumption decreases

TABLE 2—Effect of Treatment with Furazolidone or Dihydrostreptomycin Dust on Chronic Respiratory Disease (CRD) Morbidity and Mortality (Trial 2)

Group	Treatment	No. birds	Total deaths (No.)	Total deaths (%)	Death due to CRD	Total culls	Av. gain (lb.)	Av. feed conversion ratio
1	Furazolidone dust	600	10	1.6	6	0	1.89	2:46
2	Dihydrostreptomycin dust	600	6	1.0	4	0	1.84	2:50
3	Untreated controls	600	22	3.7	16	2	1.74	2:52

in proportion to morbidity. Basic precautions while using dust treatments include: (1) closing doors and windows to eliminate air currents which may interfere with dispersion; and (2) extinguishing brooder flames until the dust settles.

Since the drugs or the vehicles may be irritating or allergenic, the operator should avoid inhalation and unnecessary contact with the medication by wearing coveralls, gloves, and a hood with air filter mask and goggles.

Our results indicate that use of either dihydrostreptomycin dust of furazolidone dust is of value in flock treatment of CRD. The efficacy is probably due to the action of these drugs against both PPLO and bacteria, and to their administration in a vehicle which should insure their direct contact with the infected respiratory tract of the bird.

An additional possible advantage of medicated dusts may be their general distribution over the pen, hypothetically tending to decrease survival time of the infectious agents on fomites.

SUMMARY

Treatment of chronic respiratory disease (CRD) in chickens with dust preparations of either dihydrostreptomycin or furazolidone was of value in two controlled field trials. Treatment with either seemed highly effective in: (1) reducing over-all mortality; (2) reducing the number of culls; and (3) increasing the average weight gain.

The feed conversion in the 1,800 birds treated with furazolidone was slightly but consistently superior to that in the 1,800 birds treated with antibiotics; in both treated groups, it was highly superior to the feed conversion in the 1,800 untreated control birds.

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Cats Carry Bovine Tuberculosis.—Two farm cats in Europe developed severe tuberculosis of the bovine type. Several cows in the same stable had recently reacted to a tuberculin test after the herd had been free of the disease for three years.—*Vet. Bull. (Aug., 1958): Item 2386.*

Foreign Body in the Pleural Cavity of a Cat.—On necropsy of a cat which had been ill for some time, a kernel of rye was found in the pleural cavity. It had passed through the respiratory tract and entered the cavity through the resulting gangrenous fistula.—*Med. Wtryn. (March, 1958): 167.*

Cnemidocoptic Mange in the Budgerigar (*Melopsittacus Undulatus*)

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CNEMIDOCOPTIC MANGE, commonly called "scaly-leg," has been a disease of varying importance in poultry since the early nineteenth century. This disease has been reported from all parts of the world and in numerous species of birds, including the budgerigar,* since the first description of the causative mite, *Cnemidocoptes mutans*.[4]

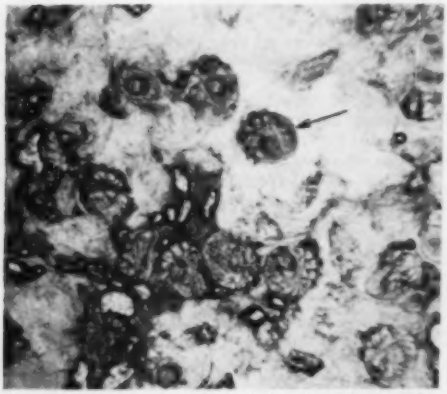

Fig. 1—Skin scraping from a budgerigar showing the presence of Cnemidocoptes pilae. x 65.

A new species of mite, *Cnemidocoptes pilae*,[4] was found to cause scaly-leg in the budgerigar in Great Britain. *Cnemidocoptes pilae* in budgerigars has been reported[5] in the United States and Egypt, and lesions produced by this mite were found on the face and cere ("scaly-face"), as well as on the legs. Following the diagnosis of *C. pilae* infestation at this laboratory, inquiries regarding its prevalence have indicated its wide distribution throughout the U.S.

The absence of information concerning this disease in American veterinary literature prompted the authors to prepare this paper, with the object of acquainting the practitioner with this syndrome and suggesting methods for its treatment and control.

CLINICAL SIGNS AND DIAGNOSIS

Thirty-two budgerigars infested with *C. pilae* have been examined in this laboratory. The lesions are most commonly seen on the face and legs and are gray-white to yellowish, appearing as powdery, granular masses which, upon close examination, are seen to be pitted, resembling a honeycomb. Microscopic examination of deep skin scrapings cleared in 5 per cent potassium hydroxide readily reveals the mite (fig. 1).

Fig. 2—Budgerigar with cnemidocoptic mange. Notice overgrown beak and honeycombed granular lesions.

The extent and location of the lesions vary. All birds examined in this laboratory showed lesions on the face. The lesions appear first at the base of the cere and the corners of the mouth, and later may extend to form a masklike honeycombed mass covering the eyes, forehead, cere, and areas adjacent to the beak. The beak often becomes distorted, friable, and overgrown and will present a honeycombed appearance, especially near its base (fig. 2).

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The authors thank Dr. W. E. Jameson, Jr., for his help in identifying C. pilae.

*Synonyms include shell parakeet, grass parakeet, undulate parakeet, and parakeet.

Generally, the legs are also involved—the lesions seem to start on the point of the hock and may progress to cover the entire nonfeathered portions of the legs. Occasionally, lesions surround the vent. In one instance, mites were found in skin scrapings from the tips of the wings and in skin covering the breast.

The presence of this mite does not appear to irritate the bird since scratching or biting of the lesion is seldom observed. The absence of pruritus can be explained by the histopathological sequence of infestation in which an inflammatory reaction was observed only during the initial penetration of the mite into the epidermis.[6] The mites appear to complete their entire life cycle within the epidermis while feeding on keratin.[3] Pouches formed by the mites initially, and during subsequent reproduction, are apparently responsible for the honeycombed appearance of the lesion.

TRANSMISSION AND TREATMENT

This disease appears to spread slowly, if at all, between adult birds. Experimental transmission between adult birds by contact has not been demonstrated. One breeder reported its occurrence in his aviary, but only after several years of contact between infested and noninfested birds.

The primary mode of transmission appears to be from parent to offspring during the nestling period by way of direct contact

TABLE I—Toxic and Therapeutic Effect of Seven Drugs on Parakeets Infested with Cnemidocoptes Pilae

Drug*	Toxicity trial		Treatment trial	
	Dose rate	Results	Dose rate	Results after 1 mo.
Co-Ral	.25% solution; complete immersion.	Parakeets died within 2 hr. after treatment.	—	—
Dow M-946	5% W/V; complete immersion.	Parakeets died within 2 hr. after treatment.	—	—
Mangeol	Local application on 2 consecutive days.	Ataxia, depression, monodirectional movement; recovered.	—	—
	Local application once.	Trembled next day; recovered.	—	—
Gexane	.05% solution; complete immersion on 2 consecutive days.	Convulsions & death within 48 hr.	.1% solution; local application twice at 7-da. interval.	Lesions reappeared; mites.
	Local application on 3 consecutive days.	Nontoxic.	—	—
	.25% solution; local application on 3 consecutive days.	Death in 48 hr.	—	—
Benzyl benzoate	25% emulsion; local application.	Nontoxic.	Daily for 3 da.; single treatment 7 days later.	No lesions; no mites.
Led-O-San	Local application.	Nontoxic.	Daily for 7 days.	No lesions; mites in 1 bird.
Eurax	Local application.	Nontoxic.	5 treatments on alternate days.	No lesions; no mites.
Controls	.....	.....	No treatment.	No improvement.

*Co-Ral, an organic phosphate, is marketed by Chemagro Corp., New York, N.Y.; Dow M-946, an organic phosphate, was supplied by Dow Chemical Co., Midland, Mich.; Mangeol (containing 33.8% benzyl benzoate, 7.5% soap, and 0.25% technical chlordane) is made by Haver-Lockhart Laboratories, Kansas City, Mo.; Gexane (a 1% emulsion of the gamma isomer of benzene hexachloride) is marketed by R. J. Strasenburgh Co., Rochester, N.Y.; Benzyl benzoate, U.S.P. (prepared as a 25% emulsion with glyceryl monoricinoleate S.); Led-O-San (containing 1.55% calcium polysulfide and 0.20% hexachlorodihydroxy diphenyl methane) is made by Lederle Laboratories, New York, N.Y.; Eurax (containing 10% N-ethyl-o-crotonotoluide in a vanishing cream) is marketed by Geigy Agricultural Chemicals, New York, N.Y.

during feeding. In a local aviary, in which approximately 80 birds are housed in a single pen, infestation has been confined for 16 months to the pair originally infested and to their offspring.

This is a chronic disease and recovery is dependent on treatment. It was found that 0.1 per cent *gamma* isomer of benzene hexachloride cured mild to moderate infestation of *C. mutans* in chickens by a single treatment and that severe cases required two applications.[2] Benzyl benzoate has been recommended as a treatment for scaly-face and scaly-leg, with daily applications of the drug for ten days and subsequent painting of affected areas in severe infestations.[3]

More recently, the use of mesulphen (60%) in rape oil at strengths of 1:3 to 1:1, applied every second or third day for three or four weeks, was reported for treatment of *C. pilae* infestation.[1] Tetraethyl thiuram monosulfide (25%) at strengths 1:29 to 1:9 in water or 70 per cent alcohol was also recommended in treating this disease.[1] If treatment was applied properly, it was found that the condition seldom recurred.

Seven drugs that are known to have acaricidal properties have been tested on parakeets in this laboratory. Each drug was applied to 4 parakeets naturally infested with *C. pilae* according to the manufacturer's recommendation for use in other pets (table 1). In all treated groups, as much as possible of the detritus was removed and the drug was applied to affected areas about the face, legs, and vent with a cotton applicator.

DISCUSSION

The successful treatment of cnemidocoptic mange in individual pet budgerigars submitted to the veterinarian should not present any difficulties. It is important that the scales be removed during the application of the drug and that the drug be thoroughly applied.

When *C. pilae* infestation is diagnosed in an aviary, control of the disease based on treatment should be instituted. Although spread of the disease among adult birds by contact is apparently of little consequence, all affected birds should be isolated in a separate pen. Such a procedure will facilitate ease of treatment and permit ready observation of nonaffected birds for any appearance of lesions. Eggs and newly-hatched chicks of affected adult birds should be placed with nonaffected adult birds.

It is also recommended that breeding among affected mature birds be temporarily discontinued until recovery is complete. The aviary owner should be alerted to any subsequent cases that may develop.

SUMMARY

1) Current information on Cnemidocoptic mange in the budgerigar as caused by *Cnemidocoptes pilae* is presented.

2) Observations on the effect of several drugs in the treatment of the disease are described and their efficacy discussed. N-ethyl-o-crotonotoluide (10% in a vanishing cream base) was found to be effective and nontoxic in treating *C. pilae* infestations.

A laboratory-prepared benzyl benzoate (25% emulsion) was found to be effective in treating the disease; however, a commercial preparation of benzyl benzoate emulsion was toxic.

3) Recommendations for the treatment and control of this disease are discussed.

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Survival of a Mange Mite.—The mange mite (*Sarcoptes rupicaprae*) of the chamois was found to live at low temperatures for 12 days in detached scabs, for eight days on stones, etc., for two to seven days in a humid medium at 68 F., but only up to six days on man.—*J. Boch in Zentralbl. f. Vet.-med. (Aug., 1957): 603.*

Nutrition and Wound Healing

The principal factor in impaired wound healing is a cellular privation due to a lack of essential nutrients, the inaccessibility of metabolites to the wound tissues, or the inability of the cells to utilize the metabolites. Protein starvation is characterized by retardation of all phases of wound repair, but healing ultimately is accomplished. The benefits which result when methionine or cystine are supplied indicate the importance of amino acid sulfurs in wound healing.

The administration of any cortisone type of hormone results in depressed cell respiration and division and a decrease in circulating amino acids. An overdose of these cortisones induces cellular starvation.

Total body irradiation retards collagen formation. Large amounts of local irradiation have a inhibitory effect, even on remote shielded wounds.—*New England J. Med. (Aug. 7, 1958): 275.*

Enterotoxic Colibacillary Syndrome of Pigs.—This title is sugeted as the most suitable for the disease known as "edema disease," "hemorrhagic gastroenteritis," "weaning disease," "colibacillary toxemia," and "enterotoxemia." That the causative agents are strains of *Escherichia coli,* characterized by hemolytic properties and belonging mainly to three serotypes, has again been confirmed. The thermolabile toxin elaborated by these strains induces specific antibodies when inoculated into pigs.

Factors such as weaning and inadequate diet, especially a lack of proteins or an excess of carbohydrates, seemed to be involved. The *Esch. coli* in the intestine apparently become pathogenic under certain conditions. Hygenic and dietary measures are of value, as is treatment with sulfonamides and antibiotics. No vaccine can be preconceived.—*C. Quinchon et al. in Rec. méd. vét. (July, 1958): 437.*

Digestion in the Pig's Cecum.—All herbivorous mammals have one or more roomy compartments in the digestive tract for the digestion of fibrous feed. To test the function of the cecum in swine, 4 of 10 pigs from two litters at McGill University were cecectomized when 6 to 7 weeks old, one month after weaning. There was little difference in the ability of these and normal pigs to digest various rations and little difference in their growth rate, whether on experimental or practical rations.

It was concluded that, in pigs, the cecum plays an insignificant role in the breakdown of feed substances.—*D. G. Dale et al. in J. Anim. Sci. (Aug., 1958): 684.*

Potatoes as an Animal Food

Raw potatoes are not recommended for pigs but, when cooked, 400 lb. of potatoes is about equal to 100 lb. of grain, except that they lack vitamins A and D and minerals. Molasses serves as an appetizer. A suggested ration contains 400 lb. of cooked potatoes, 100 lb. of crushed grain, 50 lb. of meat meal, 5 lb. of molasses, 2 lb. of crushed limestone, and 2 lb. of salt.—*J. Agric. S. Australia (May, 1958): 485.*

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As a cattle feed, potatoes and apples may cause indigestion, so cows should not be fed more than 10 to 15 lb. daily. Since both are low in protein, meat meal (1 lb. or less daily) should be added to the ration. The potatoes and apples should be sliced so the animals will not choke on them.—*J. Agric. S. Australia (June, 1958): 542.*

Seaweed as a Feed.—Because of its exceptionally high vitamin content, seaweed, the only known vegetable source of vitamin B_{12}, may be used as a nutrient for man and animals. Seaweed is a good source of carotene, vitamin B_1, vitamin E, and folic acid. Because of its mineral content, it may also be used as a fertilizer.—*Sci. News Letter (Aug. 9, 1958): 87.*

Hypocalcemia in the Cat.—A cat in New Zealand, which developed hypocalcemia three weeks after parturition, recovered rapidly after it was given a 50 per cent solution of calcium borogluconate intravenously (3 ml.) and subcutaneously (2 ml.).—*Vet. Bull. (Sept., 1958): Item 2953.*

Feeding Lactating Dogs.—A bitch which is nursing a large litter of pups will require up to three times the normal amount of food when the pups are a month old. If the nutrients are not available, she will obtain them from her body tissues.—*Sci. News Letter (July 5, 1958): 9.*

Editorial

Inherited Canine Defects—Our Attitude Toward Them

Veterinarians frequently are requested by breeders to correct, surgically or otherwise, defects in individual animals. This often raises the question of ethics, and what the professional man's attitude toward such requests should be. Obviously, when only the animal's individual welfare is considered, the response should be based on humanitarian and economic factors. However, as too frequently happens, the request is based on a desire to fit the animal for the show ring or for breeding purposes. A veterinarian's participation in such corrections must be considered as contributing to fraudulent practice.

In dogs, if the common hereditary defects found in America were classified, perhaps the three most important would be *cryptorchidism, hip dysplasia,* and *unstable temperament.*

In a less important category would be such defects as umbilical hernia, cleft palate, harelip, atretic nares, ectropion or entropion, undesirable dewclaws, poor ear or tail carriage, and defective coat or color.

Physical Defects

Cryptorchidism.—This condition could be more serious than monorchidism, provided that the single testicle is in the scrotum. Both conditions are inheritable and their incidence is said to be increasing.

Transplanting an ectopic testicle to its normal position can be attempted by plastic surgery or by hormone therapy but neither method is seldom satisfactory. One authority,[1] referring to cryptorchidism, said "Any type of hormonal therapy is a waste of time [and so is] any surgery other than to remove the testicle. . . ."

The effects of hormonal therapy on cryptochidism in boys is far from convincing. Therefore, there would seldom, if ever, seem to be justification for attempting such therapy in animals. Even if it were successful, for the welfare of the breed the practice should be condemned.

According to the American Kennel Club, "A dog which is blind, deaf, castrated, spayed, or which has been changed in appearance by artificial means, except as specified in the standard for its breed, or a male which does not have two normal testicles, normally located in the scrotum, may not compete in any dog show and will be disqualified" (*see* British ruling, p. 499).

Hip dysplasia.—Defective development of the hip joint has been reported as occurring in most breeds of dogs but most frequently in the large breeds. According to one authority,[2] there is evidence "that hip dysplasia is hereditary as a recessive characteristic, but not as a simple recessive." He recommends that neither the sire, the dam, nor the litter mates of a "dysplastic pup" should be used for breeding; furthermore, it is "cruel to propagate this painful defect."

Mental Defects

Although less publicized, perhaps the most common and most serious hereditary defects in dogs are mental attributes that make them unfit for work or as pets. While such are quickly detected by those who know and understand dogs, they are usually not appreciated by the increasing percentages of our population who have had little contact with nature and who know little or nothing about animals. Furthermore, with the increasing trend of such people to evaluate animals, as they do trinkets, on their superficial rather than their basic qualities, it becomes easier for breeders to stress trifles in the appearance of a dog rather than fundamentals such as the behavior pattern. Should one dispute the old saying that "A good horse can't have a bad color?" Also, can a shy, nervous, or vicious dog qualify as "man's best friend?"

The Veterinarian's Responsibility

It is sometimes difficult to convince dog breeders of their great responsibility for the future of the breed. Many conscientious breeders simply do not appreciate the importance of fundamental soundness in breeding animals and, if they do, many are reluctant to sacrifice immediate income for future benefits.

It is, therefore, the veterinarian's responsibility not only to refuse to take part in the correcting of inherited defects which would make it possible for the animal to be exhibited and to serve as a stud, but to impress breeders with the inherent dangers that might result from such practices.

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ABSTRACTS

Swine Influenza and Virus Pneumonia of Pigs

Pigs, obtained by hysterectomy and housed in isolation units, were infected experimentally when 1 week old with the viruses causing swine influenza or virus pneumonia of pigs (VPP). Both viruses stimulate similar gross pathological changes consisting of plum-colored consolidation of the apical and cardiac lobes of the lung; however, the response of the bronchial lymph nodes was different. Histopathological lesions in both diseases consist primarily of small and large round cell infiltrations.

Swine influenza virus elicited consistent tissue responses from the third through the fifth day which were distinct from VPP. Degenerative and regenerative changes were observed in this early period. From the sixth day on, however, small and large round cells were increasingly evident in perivascular and peribronchiolar reactions. Maximum cellular reaction had occurred by the eleventh day.

No histopathological changes were observed in VPP-infected pigs in the first ten days. After that, a gradual but increasingly severe small round cell and lymphocytic cell infiltration occurred. Perivascular reactions often were so severe that it was difficult to distinguish the vessels. The lumina of bronchi were almost obstructed, due to hyperplasia of lymphatic tissue within the propria mucosa. Swine influenza virus did not elicit as marked an infiltration of round cells as VPP. There also was no evidence in VPP of the necrosis or regeneration characteristic of swine influenza virus infection.—[*Huseyin K. Urman, Norman R. Underdahl, and George A. Young: Comparative Histopathology of Experimental Swine Influenza and Virus Pneumonia of Pigs in Disease-Free, Antibody-Devoid Pigs. Am. J. Vet. Res., 19, (Oct., 1958): 913-917.*]

Effect of Parasites on Calves

Tests involved 29 Jersey calves, 6 to 9 months old, which were fed a ration containing 11 per cent digestible protein (DP) and 65 per cent total digestible nutrients (TDN) and were experimentally infected as follows with: (1) 118,000 to 224,100 *Ostertagia ostertagi* larvae, (2) 224,000 to 448,400 *Trichostrongylus axei* larvae, and (3) 61,000 *O. ostertagi* and 121,800 *T. axei* larvae to 110,300 *O. ostertagi* and 223,000 *T. axei* larvae.

Of 4, 9-month-old calves fed a ration of 11 per cent DP and 65 per cent TDN and given 1 million *T. axei* larvae, 1 showed clinical parasitism and 3 showed only subclinical parasitism. Noninfected calves gained an average of 2.09 lb. daily; infected calves lost 0.4 lb. Feed consumption was reduced 43 per cent in infected calves. Feed utilization was 0.16 lb. per pound of feed in the 4 noninfected and −0.06 lb. in the infected calves.

Of 4, 9-month-old calves fed a ration of 7 per cent DP and 65 per cent TDN and given 1 million *T. axei* larvae, 2 showed clinical parasitism and 2 showed subclinical parasitism. The average daily gain in the 4 noninfected calves was 1.22 lb.; infected calves lost an average of 0.03 lb., and feed intake was reduced 29 per cent. Feed utilization was 0.10 lb. per pound of feed in noninfected and −0.07 lb. in infected calves.—[*George E. Cauthen and James F. Landram: The Effect of Experimental Infection with Ostertagia Ostertagi and Trichostrongylus Axei in Calves on Weight Gain, Feed Consumption, and Feed Utilization. Am. J. Vet. Res., 19, (Oct., 1958): 811-814.*]

Ringworm Fungi of Large Wild Mammals

Hair specimens from 1,758 large wild mammals trapped in southwestern Georgia and northwestern Florida were tested for the presence of dermatophytes. Only 1.1 per cent of the animals yielded cultures of Trichophyton and Microsporum. Six isolates of *Trichophyton mentagrophytes* were obtained from opossums trapped in areas frequented by domestic animals.

Fifteen isolates of a red-pigmented Microsporum, believed to be a new species, were obtained. These were recovered from 11 opossums, 1 cottontail rabbit, 1 raccoon, and 2 striped skunks.

None of the animals had clinical signs of infection and all of the collected hair specimens were negative for fungi by direct microscopic and ultraviolet examination.

Microsporum gypseum was the only dermatophyte recovered from soil samples collected in the trapping areas.—[*Sturgis McKeever, William Kaplan, and Libero Ajello: Ringworm Fungi of Large Wild Mammals in Southwestern Georgia and Northwestern Florida. Am. J. Vet. Res., 19, (Oct., 1958): 973-975.*]

New Pet Magazine

Your Family Pet is a new illustrated (in color) quarterly magazine, intended for distribution to his clients by the veterinarian. Mr. H. H. Miller is editor; consulting editors are Drs. C. E. DeCamp of Scarsdale, N. Y., and Hadley C. Stephenson, Ithaca, N. Y.

This publication is ethical in its approach and will give the owner helpful information concerning the health and welfare of his pets.

Complete information and sample copies can be obtained from Better Impressions, Inc., 155 Ave. of the Americas, New York 13, N. Y.

FOREIGN ABSTRACTS

Effect of Administration of Antiserum on the Development of Immunity from Subsequent Vaccination

Pigs weighing 35 to 42 kg. were allotted to four groups of 5 and one group of 3. Group 1 was given 0.8 ml. of anti-hog cholera serum per kilogram of body weight. After 15 days, they were given 5 ml. of crystal violet vaccine subcutaneous-

ly, repeated in 10 days. They were challenged in another 15 days with 1 ml. of hog cholera virus. Two died of hog cholera and 3 had a high fever but recovered. Group 2 was treated similarly except that the vaccine was given intradermally. Two died and 3 recovered. Group 3 was given serum but no vaccine. They were challenged 40 days later and 3 died. Group 4 was given 1 ml. of crystal violet vaccine intradermally, repeated in 10 days. When challenged 15 days later, 3 pigs showed a fever for a short time and 2 showed no reaction. Group 5 was given virus only and all 3 died.

In experiments on the protection of white mice against inoculated swine erysipelas organisms, it was shown that the injection of anti-erysipelas serum before or six days after vaccination with live vaccine prevented the development of immunity. There was less interference when the antiserum was given 15 days before the vaccine than when the interval was six days or less. Normal horse serum did not inhibit the development of immunity.—[*Y. R. Kovalenko: The Effect of the Injection of Immune Serum on the Development of Immunity from Subsequent Vaccination. Veterinariya, 35, (July, 1958): 15-20.*]

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In another report, experiments with 17 pigs indicated that vaccination against swine erysipelas with a semisolid depot vaccine 12 days after the administration of anti-erysipelas serum did not produce firm immunity. Pigs vaccinated by the same method without antiserum resisted challenge when inoculated subcutaneously and by scarification.—[*V. F. Shatalov, G. K. Muromets, and P. F. Tsimokh: Vaccination of Swine after Injection of Anti-Erysipelas Serum. Veterinariya, 35, (July, 1958): 30-31.*]—ROBERT S. HABEL.

BOOKS AND REPORTS

Veterinary Toxicology

This is a complete revision and thorough modernization of the third edition (1945) of "Lander's Veterinary Toxicology." A comprehensive text of this type has been sorely needed and will be widely welcomed.

The introduction defines and classifies poisons; discusses the general chemistry, metabolism, and modes of action; lists the factors most commonly affecting the actions of poisons and the most frequent causes of poisoning; and then outlines methods of diagnosis through necropsy, chemical analysis, and reactions to treatment.

Having laid this general foundation, the succeeding chapters discuss mineral or inorganic substances, organic drugs, organic pesticides, and miscellaneous organic compounds before moving on to the poisonous plants and a short chapter on the newer field of radioactive materials. The concluding chapter deals with toxicological analyses, some of which may serve as preliminary or presumptive tests for the practitioner, and others which would require extensive laboratory equipment and reagents, but which would provide information that would be valid and acceptable in case of legal action.

The book provides an extensive and reliable review of many conditions which interest practitioners, but the presentation is typically that of a teaching text rather than of a reference book for a busy man actively engaged in veterinary practice. The large and growing list of organic poisons—drugs, pesticides, and miscellaneous compounds—is well covered to the time of publication.

The nomenclature is that of the "British Veterinary Codex" and many of the references are from Canadian and British literature. This may prove a handicap to those to whom neither the Codex nor the references are readily available.—[*Veterinary Toxicology. R. J. Garner. 415 pages. Bailliere, Tindall and Cox, London, England; Williams and Wilkins Co., Mount Royal and Guilford Ave., Baltimore 2, Md. 1957. Price $7.50.*]—R. C. KLUSSENDORF.

Public Exposure to Ionizing Radiations

This pamphlet contains information of interest to public health workers, teachers of radiology, persons frequently exposed to ionizing radiation, and those responsible for the exposure of others. Topics include biological effects of radiation, increasing uses thereof, protective action, and laws and regulations.—[*Public Exposure to Ionizing Radiations—What Public Health Personnel Need to Know. 55 pages; illustrated. American Public Health Association, 1790 Broadway, New York 19, N. Y. 1958. Price $1.35.*]

Gout

This most readable and complete book of 200 pages with 16 colored and 60 black and white illustrations is authenticated by 300 references. The history of this, one of the oldest recognized diseases, is most interesting, extending back to the time of Hippocrates, 460-370 B.C., who was acquainted with the malady. Brief reference is made to the disease in lower animals, including fowl, dogs, horses, and reptiles.—[*Gout. By John H. Talbott. 2nd rev. ed. Grune and Stratton, 381 Fourth Ave., New York 16, N. Y., and 99 Great Russell St., London, W. C. 1, England. 1957. Price $6.75.*]—CHARLES MURRAY.

Ultramicro Methods

This is a practical manual, designed for use in hospital laboratories, of ultramicro methods for the quantitative determination of chemical constitutents of blood or other body fluids. It contains chapters on special equipment, reference works, collection of samples, and specific instructions for tests such as those for calcium, chlorides, glucose, and cholesterol.—[*Ultramicro Methods for Clinical Laboratories. By Edwin M. Knights, Jr., Roderick P. MacDonald, and Jaan Ploompuu. Illustrated. 128 pages. Grune and Stratton, Inc., 381 Fourth Ave., New York 16, N. Y. 1957. Price $4.75.*]

THE NEWS

Preliminary Scientific Program—XVIth International Veterinary Congress

The Organizing Committee of the XVIth International Congress has issued a preliminary program for the sessions to be held in Madrid, Spain, May 21-27, 1959.

The scientific programs of the two general, five sectional, and 19 subsectional meetings list the following topics:

Section I—Veterinary Medicine

Fundamental sciences.—1) The lymphatic system of the mammary gland of the cow and its importance for the lacteal secretion. 2) Blood groups of domestic animals.

General pathology.—1) New diagnostic methods at the veterinary clinics. 2) Animal diseases produced by industrial gases.

Clinics of large animals.—1) Advances in bone and joint surgery in large animals. 2) Disturbances of metabolism in highly productive cows.

Clinics of small animals.—1) Canine dermatosis. 2) Cellular therapeutics of the dog.

Avian pathology.—1) Chronic respiratory disease. 2) The effect of nutrition on resistance against avian infections.

Section II—Epizootiology

Virus processes.—1) Bluetongue. 2) The epidemiological picture in foot-and-mouth disease.

Bacterial Processes.—1) Coliform infections in domestic animals. 2) The general pathogenic role of the P.P.L.O.

Parasitic processes.—1) Immune reactions to nematode infestation.
2) Immunization problems of animals against helminthiasis.

International veterinary police.—1) Standardization of biological products. 2) Control of epizootic in the international field.

Section III—Veterinary Public Health

Zoonoses.—1) Sylvatic rabies. 2) Brucellosis and some prophylactic principles.

Food hygiene.—1) Tuberculosis of domestic animals with special reference to the one produced by the human bacillus. 2) The significance of parasites for food hygiene.

Industrial hygiene.—1) Mission of the veterinarian in the inspection of meat industries. 2) Bacteriological control of industrially prepared foods.

International sanitary legislation.—1) International cooperation in the control of zoonoses. 2) Conditions for the import of animals and products of animal origin.

Section IV—Zootechnics

Feeding.—1) Intensive forage production and livestock health. 2) Alimentary balances in livestock rations.

Genetics and reproduction.—1) Actual value of the progenitor test methods. 2) Genetics of diseases.

Animal production.—1) Factors of the medium and organic resistance. 2) Constitutional and organic resistance to production.

Industrial technology.—1) Wool technology. 2) Technology of other animal industries.

Section V—Veterinary Profession

Veterinary teaching.—1) On the teaching of zoonoses at veterinary faculties and high schools. 2) The teaching of veterinary specialities.

Professional practice.—1) Dividing the tasks in veterinary practice between the qualified veterinarian and the nonqualified assistant. 2) The development and future prospects of the veterinary profession in view of the present problems.

When information is received from the Organizing Committee in Madrid with respect to program participants selected from the United States, it will be published along with other late news about the Congress.

Summer Jobs Open for Students of Veterinary Medicine

Applications are currently being accepted from junior students of veterinary medicine for student-trainee positions that provide on-the-job training during summer vacations. The student-trainee will be classified in grade GS-5 at $4,040 a year and upon graduation from college, they will be eligible for a position as veterinarian at grade GS-7 at $5,430 a year.

Filled by examination, these student-trainee positions are for employment with the Department of Agriculture at various locations throughout the United States.

Full information concerning these positions and instructions for making out applications are given in form 5000-AB, and may be obtained from any post office, except in cities where a United States civil-service regional office is located.

Send the application card form 5000-AB to the Executive Secretary, Board of United States Civil Service Examiners, U.S.D.A., Washington 25, D.C. The deadline for filing applications is Nov. 19, 1958.

s/ U. S. Civil Service Commission.

AMONG THE STATES AND PROVINCES

California

State Association.—The annual midwinter conference of the California V.M.A. will be held February 2-4, 1959, at the School of Veterinary Medicine, University of California, Davis.

Large and small animal sessions will be held,

with an outstanding closed circuit television program on February 4. TV moderators will be Drs. Charles H. Reid and Robert M. Cello.

The entire program is being arranged by Dr. John W. Kendrick, who will be assisted by Drs. C. N. Bramer, Robert Harris, Robert M. Cello, and Blaine McGowan, Jr. General program chairman for the C.V.M.A. is Dr. Charles H. Ozanian.

Delaware

New Castle County Association.—The newly elected officers of the New Castle County V.M.A. for 1958-1959 are: Drs. John L. Wilkins, Wilmington, president; and Arthur Paul Mayer, Jr., Newark, secretary-treasurer.

s/A. P. MAYER, JR., *Secretary-Treasurer.*

Florida

Proceedings Book Available from Florida Conference.—Dr. W. R. Pritchard, head, Department of Veterinary Science, University of Florida, Gainesville, announced recently that extra copies of the Proceedings of the first annual Florida Conference for Veterinarians are now avaliable upon request.

All manuscripts presented at the Florida conference held May 17-18, 1958, at the J. Hillis Miller Health Center, University of Florida, are included in the 42-page Proceedings booklet.

s/W. R. PRITCHARD, *Correspondent.*

Illinois

Annual Conference and Extension Short Course.—The thirty-ninth annual Illinois conference and extension short course for veterinarians was held at the College of Veterinary Medicine, University of Illinois, Champaign, Oct. 23-24, 1958.

Dr. C. A. Brandly, dean, College of Veterinary Medicine, delivered the welcoming address to the conferees. Visiting speakers, practicing veterinarians, and staff members of the College of Veterinary Medicine at the University of Illinois, discussed many of the new techniques in fighting livestock diseases. Also included on the conference's agenda were new diagnostic and surgical procedures, as well as methods for the prevention and control of animal and poultry diseases.

Several television demonstrations, movies, and discussions ranging from "Tranquilizing Drugs" to "Canine Skin Problems" comprised the balance of the program.

Other conference events included a chicken barbecue, class reunions, a ladies' program, a banquet, and a dance.

s/L. E. BOLEY, *Chairman, Conference Committee.*

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Chicago Association.—The October 14 meeting of the Chicago Veterinary Medical Association was held in the Lincoln Room of the LaSalle Hotel. The guest speaker was Dr. W. W. Armistead, dean, College of Veterinary Medicine, Michigan State University, and past-president of the AVMA. His subject was "Veterinary Education."

s/CHARLES H. ARMSTRONG, *Secretary.*

Indiana

Central Association.—The fifth annual symposium on small animal diseases and dinner meeting of the Central Indiana V.M.A. was held Oct. 15, 1958, at the Highland Country Club in Indianapolis.

The association's afternoon program consisted of the following subjects and speakers: Newer Surgical Approaches to Common Practice Problems—Dr. L. A. Johnson; A Program for Canine Distemper Immunization—J. A. Baker; Problems of Canine Geriatrics—T. H. Brasmer; and Practical Laboratory Tests (with demonstrations)—J. A. Newberne.

Dr. George Burch, New Augusta, moderated a panel discussion and question-and-answer period in the evening portion of the symposium.

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Seventh District Association.—The Seventh District V.M.A. held its September meeting at the Hotel Deming in Terre Haute. Dr. Alfred G. Schiller, University of Illinois, was the association's guest speaker for the meeting.

Dr. Klussendorf of Commercial Solvents, Terre Haute, will discuss "Stress in Large Animals" at the next meeting of the association scheduled for Nov. 21, 1958, at the Klusmeier Drive-Inn, Linton, Ind.

s/A. P. GRAY, *Secretary-Treasurer.*

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New Women's Auxiliary Formed.—The wives of the Seventh District V.M.A. members met in the Silver Room of the Hotel Deming, Terre Haute, in conjunction with their husbands' convention in September. At this meeting, they were successful in forming a Women's Auxiliary to the Seventh District V. M. A.

s/A. P. GRAY, *Secretary-Treasurer to the Seventh District V.M.A.*

Kansas

School of Veterinary Medicine at K.S.C. Caps Veterinary Medicine Week with Open House.—The veterinary students at Kansas State College successfully persuaded Gov. George Docking into proclaiming Oct. 20-26, 1958, as Veterinary Medicine Week in Kansas. A highlight of the week's events was the second annual Open House at K.S.C.'s School of Veterinary Medicine, on October 25.

In the proclamation, Governor Docking paid special tribute to the veterinary profession "in recognition of its outstanding record, its devotion to duty, and its many daily tasks in protecting and safeguarding animal health."

Looking on as Gov. George Docking signs a document proclaiming Veterinary Medicine Week October 20-26 are: standing (left to right)—Andy Stewart, Davenport, Iowa, chairman of the Kansas State veterinary school open house held October 25; Dr. E. E. Leasure, dean, School of Veterinary Medicine at Kansas State; and Dr. Merle Henrickson, Emporia, president of the Kansas V.M.A.

Veterinarians from all over the state were issued individual invitations to the Open House. Andrew Stewart, Davenport, Iowa, chairman of the student-run affair, said the primary purpose of the Open House was to better acquaint Kansas with veterinary medicine. Students from the K.S.C. School of Veterinary Medicine demonstrated many of the techniques and practices that are used in the treatment and care of animals.

Displays and exhibits from the departments of anatomy, pathology, physiology, and surgery & medicine were also included. The phase devoted to surgery and medicine was further divided into small and large animal sections. The small animal division featured a dog show with demonstrations of the various breeds and their respective case histories.

s/CARL ROCHAT, *Correspondent.*

Louisiana

State Association.—The seventh annual fall conference of the Louisiana V.M.A., Inc., was held on Aug. 24-26, 1958, at the Monteleone Hotel in New Orleans. Veterinarians from Louisiana, Texas, and Mississippi were in attendance.

The association's roster for the coming year is as follows: Drs. James N. Thomas, Welsh, president; O. C. Granzin, Baton Rouge, vice-president; Robert K. Morris, Lake Charles, secretary; and Henry C. Melius, Metairie, treasurer.

s/ANTHONY M. STEFANSKI, *Secretary.*

Missouri

Annual Short Course.—The annual short course for veterinarians was held Oct. 6-7, 1958, in Columbia. The meeting was sponsored by the Missouri V.M.A. and the School of Veterinary Medicine at the University of Missouri.

A highlight of the sessions, on the first day of the course, was a special closed circuit television demonstration on clinical and laboratory methods featuring Dean A. H. Groth, of the School of Veterinary Medicine, University of Missouri.

Other of the sessions were held in the Student Union Building and stressed both large and small animal programs with a roster of speakers including: Dr. A. H. Quin, Jensen-Salsbery, Kansas City; Mr. L. S. Larson, Midwest Feed Manufacturers Association; Dr. L. O. Mott, ARS; Dr. P. E. Zollman, Mayo Clinic; and Dr. P. C. Bennett, Iowa State College.

Montana

Women's Auxiliary.—The annual business meeting of the Women's Auxiliary to the Montana V.M.A. was held during a coffee hour at the Missoula Hotel, Missoula, Mont., on June 16, 1958, with Mrs. I. W. Vinsel presiding.

Mrs. Lewis Moe, president of the Women's Auxiliary to the AVMA, was the auxiliary's guest of honor. Mrs. Moe's visit was the first time that a national president had visited the Montana auxiliary.

The group decided to set up a Loan Fund for Montana students in veterinary medicine. The administration of this fund will be worked out in the coming year and presented to the group at the next annual meeting.

The following officers were elected for the coming year: Mrs. Don K. Shaffner, Dillon, Mont., president; Mrs. R. J. Miser, Conrad,

president-elect; Mrs. Jay Newhall, Bozeman, first vice-president; Mrs. Del Gates, Lewistown, second vice-president; Mrs. E. L. Cooper, Missoula, third vice-president; Mrs. Orlin Bakke, Columbus, secretary; and Mrs. David Colmey, Livingston, treasurer.

A luncheon meeting, which Mrs. Moe addressed, was held the next day at the Hotel Florence.

The wives of the Missoula veterinarians, chairmanned by Mrs. Shirley Brogger, made all the arrangements for the social activities of the women at the convention.

New Hampshire

New England Association.—The twenty-fourth annual meeting of the New England V.M.A. met at Wentworth-by-the-Sea in Portsmouth, N.H., Sept. 28 to Oct. 1, 1958.

The five sessions of the meeting were presided over by: Drs. Forrest Tenney, Peterborough; Joseph Seraichick, Keene; Paul Fessenden, Milford; Wilbur Collins, Hanover; and Wilson Haubrich, Claremont. Hon. Eralsey Ferguson, president of the New Hampshire State Senate, welcomed the group.

Particular emphasis was given to the latest developments in diagnostic procedures. Surgical techniques were also stressed. Subjects ranged from "Research on Exotic Diseases at the Plum Island Animal Disease Laboratory" to "Fractures and Repairs in Small Animals."

Dr. R. E. Rebrassier, president of the AVMA, addressed the banquet attendees on September 30. An extensive ladies program was also provided.

s/C. LAWRENCE BLAKELY, *Secretary-Treasurer.*

New Mexico

State Association.—The New Mexico V.M.A. held its annual meeting Sept. 8-9, 1958, at the La Pasoda Hotel in Santa Fe.

Dr. James Archibald, head of the Small Animal Department, Ontario Veterinary College, and Dr. E. D. Barrows, head veterinarian, Wyoming Hereford Ranch, Cheyenne, Wyo., were the principal speakers. An interesting talk on the "Progress of Veterinary Medicine in the U.S.A." was presented by Dr. Charles Murray, dean emeritus at Iowa State College.

Newly elected officers for the ensuing year are: Drs. Glen Bolton, Albuquerque, president; Lloyd Skow, Raton, vice-president; and Earl R. Leslie, 907 Alamosa, Carlsbad, secretary-treasurer.

s/E. R. LESLIE, *Secretary-Treasurer.*

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Women's Auxiliary.—The annual meeting of the Women's Auxiliary to the New Mexico V.M.A. was held Sept. 8, 1958, at the La Pasoda Hotel in Santa Fe, in conjunction with the State Association's convention.

During the business meeting, Mrs. Gladys Evans presented a report on the 1958 AVMA Convention in Philadelphia and the auxiliary voted to continue its contribution to the General and Research Funds. Mrs. Joseph Knappenberger, wife of the president of Haver-Lockhart, was the auxiliary's guest at the meeting.

The officers for the following year will be: Mrs. Katherine Heise, Albuquerque, president; Mrs. Shirley Payne, Albuquerque, vice-president; Mrs. Joanne Leslie, Carlsbad, secretary-treasurer; and Mrs. Gladys Evans, Albuquerque, national delegate to the AVMA Convention.

s/ JOANNE LESLIE, *Secretary-Treasurer.*

New York

State Association.—At the sixty-seventh annual meeting of the New York State Veterinary Medical Society at Kiamesha Lake, (*see* the JOURNAL, Oct. 15, 1958, p. 442), Dr. James D. Sweet, Chateaugay, president, presented the AVMA's Humane Act Award to Miss Grace E. Fainelli, 14, of Schenectady, N. Y.

Dr. James D. Sweet, president, New York State Veterinary Medical Society, is shown presenting the 1958 Humane Act Award and a $100 U.S. Savings Bond to Miss Grace Elizabeth Fainelli. These AVMA awards were given to Miss Fainelli at the 67th annual dinner of the N.Y.S.V.M.S., at which Miss Fainelli was guest.

Dr. C. E. DeCamp, Scarsdale, accepted the Award for Miss Fainelli at the AVMA Convention in Philadelphia last August. Miss Fainelli then received the award at the state society's annual dinner, in September, at which she and her family were guests. The Award consists of a $100 U. S. Government Bond and the AVMA Merit Certificate.

Dr. Charles C. Bower, Topeka, Kan., speaking for the Award's judging committee at the Philadelphia Convention termed Miss Fainelli as "a one-girl animal shelter" who was selected by the judges for her "outstanding record in the humane treatment of lost, strayed, abandoned, and orphaned animals throughout the year."

s/ JOAN S. HALAT, *Acting Executive Secretary.*

Women's Auxiliary.—The tenth annual meeting of the Women's Auxiliary to the New York State Veterinary Medical Society was held on one of the outdoor terraces of the Concord Hotel at Kiamesha Lake, N. Y., on Sept. 5, 1958.

Mrs. George Dorney, Pleasant Valley, president-elect, presided. Mrs. Leo Wuori, Briarcliff Manor, and Mrs. Milton Covert, Rochester, were in charge of the auxiliary's arrangements for the meeting.

One of the first acts of the auxiliary was to conduct a moment of silence in memory of Mrs. Harry Hodges, Ithaca, former president, who met with a fatal automobile accident on June 20, 1958.

Additional items of business included a report of the auditing committee, recommendations of the executive board, a report from the delegate to the AVMA Convention in Philadelphia, a discussion of the hobby show project, and an explanation of the six qualifications for inclusion on the AVMA Honor Roll, by Mrs. Dorney.

The newly elected officers for the ensuing year are: Mrs. George Dorney, Pleasant Valley, president; Mrs. C. E. Fletcher, New York City, president-elect; Mrs. Thomas J. Love, Watkins Glen, secretary; Mrs. John Sweatman, Roxbury, treasurer; and Mrs. Merrill Goodman, Washingtonville, membership chairman.

s/MRS. MARGARET LOVE, *Secretary.*

Pennsylvania

The Deubler Family

This family is unique in being the only father, son, and daughter combination in the United States who are all practicing veterinarians. All three are graduates of the School of Veterinary Medicine at the University of Pennsylvania and Dr. M. Josephine Deubler holds the distinction of being the first woman veterinarian to graduate from the university.

(Left to right)—The son, Dr. J. A. Deubler (UP '43); the daughter, Dr. M. Josephine Deubler (UP '38); and the father, Dr. E. C. Deubler (UP '11).

South Dakota

State Association.—Veterinarians throughout the state, totaling nearly 200, met at the Sheraton-Cataract Hotel in Sioux Falls, Sept. 16-17, 1958, for the annual meeting of the South Dakota V.M.A.

Dr. H. C. Severson, Winner, president, opened the convention. Among the speakers on the association's program were: Drs. M. D. Mitchell, state veterinarian; W. F. Waddell, Pierre; D. F. Eveleth, Fargo; E. R. Frank, Kansas State College; Lee Railsback, Ellsworth, Minn.; M. J. Twiehaus, Kansas State College; and Darrell Steele, Minneapolis.

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Women's Auxiliary.—The annual meeting of the Women's Auxiliary to the South Dakota V.M.A. was held in conjunction with the meeting of the state association in Sioux Falls Sept. 16-17, 1958.

A luncheon and business meeting were held at the Town Club with Mrs. George Chaffee, Huron, presiding. On September 16, a banquet and dance was held at the Sheraton-Cataract Hotel.

The newly elected officers of the auxiliary are: Mrs. Eugene Aldrich, Hartford, president; Mrs. William Sessions, Redfield, vice-president; and Mrs. D. F. Rigo, Menno, secretary-treasurer.

s/BETTY RIGO, *Secretary.*

Washington

State Association.—The forty-third annual meeting of the Washington State V.M.A. in Olympia, Sept. 8-10, 1958, was well attended and included a number of outstanding events in addition to the scientific program.

The convention was sponsored by the state and federal regulatory veterinarians with Dr. Fred Shigley and Dr. A. E. Crouse, both of Olympia, as cochairmen, assisted by many of the local members of the association.

Among the participants in the program were: Drs. M. S. Shahan, director of the Plum Island Animal Disease Laboratory; K. F. Wells, veterinary director-general of Canada; J. G. Hardenbergh, general consultant to the AVMA; Leo K. Bustad, University of Washington; E. E. Saulmon, area director of the U. S. ADE division; Kenneth McKay, California extension veterinarian; C. O. Seward, Bremerton, practitioner; Hugh Butler, Wisconsin State College; Roy Willie, chief of U.S. Poultry Inspection Division; D. T. Moll, Wisconsin State College; A. R. Miller, director of U. S. Meat Inspection Service; and the Hon. Albert Rosellini, Governor of the state of Washington.

The following officers were elected to serve during the coming year: Drs. William F. Harris, Puyallup, president; E. C. Stone, Pull-

man, president-elect; Robert Ebright, Bellingham, treasurer; and George Duby, Centralia, immediate past-president.

S/ROBERT M. FORD, *Executive Secretary.*

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Women's Auxiliary.—The Women's Auxiliary to the Washington State V.M.A. held its annual convention in Olympia, Sept. 8-10, 1958, in conjunction with the state association meeting.

Mrs. F. M. Shigley and Mrs. A. E. Crouse, both of Olympia, were cochairmen of the meeting. Among the diversified events was a tea held at the executive mansion, at which the guests were greeted by the state's first lady, Mrs. Albert Rosellini. The main luncheon was held on September 9, followed by a trip to Hood Canal for an indian-style salmon bake at Twanoh Park.

Officers of the auxiliary are: Mrs. Don W. Clarke, Friday Harbor, president; Mrs. Ernest Stone, Pullman, president-elect; Mrs. Philip Millard, Freeland, secretary; and Mrs. Robert Ebright, Bellingham, treasurer.—*The Californian Veterinarian, 12, (September-October, 1958).*

The past-presidents of the Women's Auxiliary to the Washington State V.M.A. were honored in special ceremonies at the 43rd annual meeting of the state association in Olympia last September.

Front row (left to right)—Mrs. Vera Hostetler, Mrs. Iola Millard, Mrs. Kay Stevens.

Back row (left to right)—Mrs. Jinx Clarke, Mrs. Kate Beckmann, Mrs. June Duby, Mrs. Lillian Kraft.

The new officers of the Washington State V.M.A. took office at the association's annual meeting in Olympia on Sept. 8-10, 1958.

Back row (left to right)—Dr. William F. Harris, president; Dr. Robert Ebright, treasurer.

Front row (left to right)—Dr. George Duby, immediate past-president; Dr. E. C. Stone, president-elect.

FOREIGN NEWS

Korea

Dr. Stinson, Veterinarian for Cheju National Ranch.—Dr. K. K. Stinson (OKL '54), formerly veterinarian at Mississippi State Penitentiary at Parchman (*see* the JOURNAL, Dec. 15, 1956, p. 590), is now manager of the Cheju National Ranch on Cheju Island, a rocky, mountainous lava up-thrust 150 miles across the choppy Straits of Korea.

Dr. Stinson was employed by the Republic of Korea to launch an extensive experiment in the importation and breeding of Brahman cattle to determine their acclimatization to Korea and to cross breed them with the hardy but poor-milking native cows. His first task was to get 200 Brahman cows and bulls from Pusan to the Island and to drive them 50 miles over the mountains, aided by an inexperienced group of Koreans with whom he had no direct language communication. A later consignment of cattle increased the herd to 475 Brahmans and 150 native cows.

Seven months later, after a severe winter, 3,000 acres were fenced and living quarters and farm buildings were constructed from the island's black lava stone. Still under construction is a large animal clinic which will provide eight box stalls and be "Brahman proof." It will contain a laboratory, surgery, drug room, portable chute, and a classroom where Dr. Stinson will instruct his assistants, which include three graduates of the School of Veterinary Medicine of Seoul National University.

Dr. K. K. Stinson (on horse); his wife, Allene; children, Patrick and Teresa, and Mr. R. T. Oliver (who submitted this report on Cheju National Ranch).

The chief medical problem is the prevalence of anaplasmosis and other tick-borne diseases. Every cow has to be sprayed (0.03% BHC and

Farm village scene on Cheju Island, showing native Korean cattle. Note the soil composition.

0.5% DDT) every two weeks regardless of weather or other conditions.

Growing feed is also a problem. The volcanic soil is basically good but the top soil, which averages 3 to 5 feet deep, has a pH of 4.5, and thus needs heavy lime fertilization.

The main purpose of the ranch is to commence a "nutrition revolution" in Korea. Since only 13 per cent of the land is arable, there is a vast amount of hill country, some of which could be converted to pasture for hardy cattle, sheep, and goats.

It may be 20 years before any advances become evident in the nation-wide Korean diet but, through disease control, cross-breeding, and selection of livestock, it should be possible for the 22,000,000 Korean people to achieve a notable increase of the protein factor in their diets.

s/MR. R. T. OLIVER, *Correspondent.*

Great Britain

Annual Congress of the British Veterinary Association.—The annual congress of the British Veterinary Association was held Sept. 21-26, 1958, at Douglas, on the Isle of Man. The meeting was attended by approximately 400 veterinary surgeons from England, Scotland, Wales, and Northern Ireland.

Delegates in attendance from overseas associations included Lt. Colonel G. T. Dalziel, AVMA; Mr. V. G. Cole, Australian Veterinary Association; Prof. D. H. J. van Gils, Dutch Veterinary Association; and Mr. C. V. Dayus, New Zealand Veterinary Association. Also in attendance was Dr. R. J. Avery, High Commissioner from Canada.

Other guests included Dr. (COR '8) and Mrs. Don A. Boardman of Rome, N.Y., and Dr. E. H. Houchin (WSC '24) of Ventura, Calif. Dr. and Mrs. Boardman terminated an extensive six-week tour of Europe by attending the congress.

The Congress was opened with the president's address in which Mr. J. McC. Ingram, president of the B. V. A., enumerated the association's accomplishments during 1957-1958. Other items of interest were the announcement that bovine tuberculosis will be virtually eradicated by 1961 or 1962, and the beginning of free examinations to be given every six months to all guide dogs belonging to blind people.

Scientific sessions included papers on "Metabolic Diseases of the Ruminant", "Skin Diseases Met with in Small-Animal Practice", "Salmonellosis in Animals", "Clinical Aspects of Nervous Diseases in the Dog", "Differential Diagnosis and Control of Respiratory Diseases of Poulty", "Mycotic Dermatitis in Sheep", "Extent and Scope of an Artificial Breeding Program for Cattle", "Cystic Hyperplasia Pyometra Complex in the Bitch", "Diseases of the External Meatus in the Dog", "Role of the Veterinarian in Public Health", "Disorders of the Lactating Sow and Newborn Pig", "Lameness in the Forelimb of the Horse", and "Distokia in the Bovine". An interesting tour was made to the Isle of Man, Board of Agriculture and Fisheries Experimental Farm, where demonstrations were conducted on artificial insemination, meat inspection techniques, and mycotic dermatitis.

At the closing session, Mr. H. F. Hebeler, a practitioner from Langport, Somerset, Eng., was installed as the new president and Mr. S. L. Hignett was named president-elect. The next annual congress will be held at Folkestone, Kent, Aug. 31 to Sept. 5, 1959.

s/LT. COLONEL DALZIEL, *U.S.A.F.(V.C.).*

STATE BOARD EXAMINATIONS

Interested persons can obtain information about applications, fees, deadlines for filing applications, and exact time and place of examinations of the respective boards by writing to the persons whose names and addresses are given below.

NEW YORK—Next written examination will be held Dec. 2-5, 1958, at New York, Albany, Syracuse, and Buffalo; the practical examination was given on Nov. 14, 1958, at Ithaca. James O. Hoyle, 23 South Pearl St., Albany 7, secretary, State Board of Veterinary Medical Examiners.

TEXAS—Next licensing examinations will be held Jan. 14-16, 1959; Austin. The completed application must be received in the board office not later than 30 days before the examination date. Mr. T. D. Weaver, 207 Capital National Bank Building, Austin 16, executive secretary, State Board of Veterinary Medical Examiners.

VETERINARY MILITARY SERVICE

Third Officer Refresher Class Graduates—Twenty-one career veterinary corps officers recently completed a two-week refresher course at the Army Medical Service Meat and Dairy Hygiene School in Chicago.

The refresher course, one of four courses taught at the school, was established two years ago; however, only two such courses had been held up until this fall. The latest developments and advances in the fields of food technology, sanitation, food inspection, and food processing are stressed in the short course.

The Meat and Dairy Hygiene School will conduct its first three-week refresher class for enlisted personnel sometime early next year. Both the officer's and enlisted man's refresher classes will be held three times in the coming year.

• • •

Foreign Students at the AMS Meat and Dairy Hygiene School—Five veterinarians from four foreign countries recently attended the veterinary officers' food inspection course at

The five foreign veterinarians who were enrolled in the officer's food inspection course at the U.S. Army Medical Service Meat & Hygiene School, Chicago, this summer are shown standing with the commandant, Colonel Ward, and the director of training, Lt. Colonel Powell.

(Left to right)—Colonel Thomas A. Ward, commandant of the Army Medical Service Meat and Dairy Hygiene School; Dr. German Guerra, Chili; Dr. Francisco C. Werner, Venezuela; Captain Mohamad Taghi Ebrahim-Pour, Iran; Dr. Jacob A. Martin, Jamaica, B.W.I.; Captain Mohamad Kamal, Iran; and Lt. Colonel John J. Powell, director of training at the Meat and Dairy Hygiene School.

The graduates of the third Officer Refresher Class at the Army Medical Service Meat & Dairy Hygiene School. Back row (left to right)— Lt. Colonel R. Kyler, U.S.A.F. (V.C.); Lt. Colonel C. W. Gollehon, V.C.; Major W. D. Hammer, V.C.; Lt. Colonel R. C. Fuller, V.C.; Major L. L. Beuschel, V.C.; Lt. Colonel C. O. Wilder, U.S.A.F. (V.C.); Lt. Colonel A. F. Allison, V.C.; First Lt. T. F. Fussell, V.C.; Major W. E. Riley, V.C.; Major T. C. McChesney, V.C.

Second row (left to right)—Lt. Colonel W. A. Nusser, V.C.; Major H. M. Miller, V.C.; Lt. Colonel B. N. Folling, V.C.; Lt. Colonel W. W. Fechner, V.C.; Major G. G. Moran, V.C.; Lt. Colonel H. B. Campbell, V.C.; Major L. D. Johnson, V.C.; Lt. Colonel H. J. Robertson, V.C.; Lt. Colonel D. Ehrlich, V.C.

Front row (left to right)—Colonel C. L. Taylor, V.C.; Major S. K. Kirk, instructor; Major G. E. Ritter, instructor; Colonel T. A. Ward, commandant; Lt. Colonel J. J. Powell, assistant commandant; First Lt. R. R. Stewart, instructor; Colonel C. H. Snider, U.S.A.F. (V.C.).

the U. S. Army Medical Service Meat and Dairy School in Chicago. The five students, sponsored by their home governments or, in one case, by the World Health Organization, flew to Chicago this summer from all parts of the world to take part in the ten-week course.

Two military veterinarians from Iran, a general practitioner and member of WHO from Jamaica, B.W.I., a Chilean professor of public health, and a public health veterinarian from Venezuela were the latest additions to a growing list of veterinarians from foreign countries who have attended the Chicago school.

A total of twenty-one veterinarians from Greece, Turkey, Iran, Chili, Yugoslavia, Pakistan, Portugal, Venezuela, and Jamaica, most of whom have been military veterinarians, have enrolled in this course during the past six years.

Primarily an introductory course for graduate veterinarians entering the armed forces, one of three courses taught at the school, it also attempts to disseminate technical information to veterinary personnel and other interested individuals, whether military or civilian, on topics concerning sanitary inspection procedures, food preservation, and other subjects of specific interest.

DEATHS

Star indicates member of AVMA

★**G. W. Closson** (KCV '05), 77, San Gabriel, Calif., well-known veterinarian and civic leader who had practiced in Southern California for 53 years, retiring about three years ago, died on Sept. 3, 1958, after a long illness.

Born in Gaylord, Kan., in 1881, Dr. Closson was the founder and former associate of the Closson-Baxter-Minsky Dog and Cat Hospital in San Gabriel. For many years, he was a member of the board of directors of the local humane society. He also held membership in and was a past-president of both the California State and the Southern California Veterinary Medical Associations. He joined the AVMA in 1905 and has been a member ever since.

Surviving are his widow, Mrs. Wilma Closson, and Dr. Arthur D. Closson of Kansas City.

Clive Daly (KSC '07), 74, Birmingham, Ala., who retired from practice in 1956, died Sept. 2, 1958.

A Mason and a Shriner, Dr. Daly belonged to the Woodlawn Fraternal Lodge. A charter member of the Vestavia Country Club and a member of the Jefferson County V.M.A., he was also a captain in the U.S. Army in France during World War I.

Surviving Dr. Daly are a daughter, two brothers, and a sister.

★**Frank H. George** (OSU '16), 65, Plain City, Ohio, died in his home, following a long illness, on Sept. 11, 1958.

A native of Plain City, Dr. George served on the board of trustees of the Methodist Church there, on the Board of Education, and as treasurer of the Plain City Fair Board for 12 years.

Dr. George was a member of the Ohio State V.M.A., the American Association of Equine Practitioners, and a past-president of the Central Ohio Veterinary Practitioners Association.

Surviving are his widow, three sons, two daughters, two brothers, and a sister.

★**Howard C. Henderson** (ISC '52), 30, Henderson, Iowa, died as a result of a car-truck collision on Highway 59, three miles north of Council Bluffs.

Dr. Henderson was the mayor of Henderson. He leaves his widow, an infant son born the day before his death, and two other children.

★**H. C. Nichols** (OSU) '17), 62, Ocala, Fla., a resident there for many years, died in the Munroe Memorial Hospital, following a long illness.

Coming to Ocala in 1919 as assistant state veterinarian, Dr. Nichols served in that capacity until 1934, when he opened an animal hospital. In 1933, he was appointed to the Florida Board of Veterinary Examiners where he served as secretary-treasurer, in addition to helping draft the laws of the state.

Dr. Nichols was a past-president of the Florida State V.M.A. and of the Southern States V.M.A. He is survived by his widow, two sons, and four grandchildren.

L. Francis Reed (COR '13), 70, Remsen, N.Y., died Aug. 24, 1958, at his home, after a short illness.

Dr. Reed was a member of the Remsen Masonic Lodge 677 of Barneveld, a member of the Ziyara Temple of Utica, and also a member of the Central New York Veterinary Medical Association.

He is survived by his widow, a daughter, an aunt, an uncle, and several cousins.

★**Benjamin H. Sayre** (KCV '08), 85, Centerville, S. Dak., died Aug. 27, 1958, only a few days after his election to life membership in the AVMA.

Born in Viroqua, Wis., Dr. Sayre had practiced in Centerville since 1923. He is a member of several masonic lodges and a charter member of the Centerville Rotary Club.

Dr. Sayre is survived by his widow, Minnie Omodt Sayre.

Other Deaths Reported.—The following deaths have been reported. The usual information for an obituary was not supplied.

Robert C. Brail (MSC '52), Reading, Mich., died Sept. 5, 1958.

William Hegenauer, Jr., (MSC '50), Bridgeport, Mich., died Aug. 28, 1958.

D A. Illingworth ('04), 76, Bennington, Vt., died Sept. 3, 1958.

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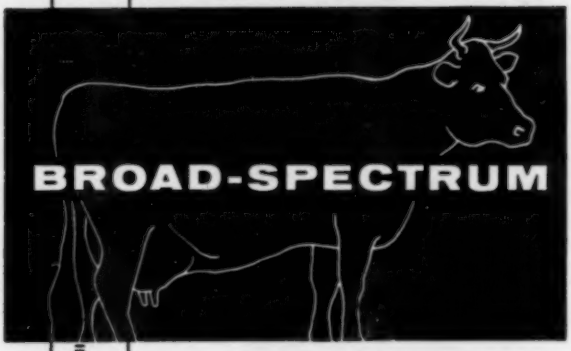

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Convention News

Drs. Edmund J. Kohler (right), and Robert M. Stader, winners of the 1958 AVMA golf tournament.

AVMA Golf Tournament Winners at Philadelphia

The coveted AVMA Trophy was won this year by a team of talented Minnesotans, Dr. Edmund J. Kohler of Stewartville, and Dr. Robert M. Stader of Rochester. In competition with other state, provincial, and territorial teams, they were the winners with a score of 74.

The tournament, held at the Aronomink Country Club on August 18, was one of the highlights of the social program at the AVMA Ninety-Fifth Annual Convention in Philadelphia.

A new trophy, the Stader-Glenney Bowl, has been added to the list of AVMA tournament prizes, and was won by Dr. William S. Boley of Harveyville, Kan., who scored a low gross of 79.

Dr. Fred J. Kingma, Washington, D.C., was presented the award for closest to the pin on the fifth hole (8 inches), and Dr. Kohler, in addition to the AVMA Trophy, walked away with the honors in the longest drive contest with his booming drive of 285 yards.

Thirteen silver trophies were presented to other winners of the various contests within the tournament. Dr. Otto Stader, Ardmore, Pa., was in charge of golf course activities.

WOMEN'S AUXILIARY

President—Mrs. E. A. Woelffer, 115 Woodland Lane, Oconomowoc, Wis.
Secretary—Mrs. A. W. Eivers, 1745 S. 13th St., Salem, Ore.

Report of the Auxiliary Workers Conference.—The Auxiliary Workers Conference was held in the Constitution and Independence Rooms of the Sheraton Hotel, Philadelphia, on Aug. 20, 1958, with 107 members in attendance. The conference was called to order by the chairman, Mrs. C. M. Rodgers.

Mrs. Wayne Riser (JOURNAL of the AVMA and AVMA *Auxiliary News*) explained that articles for the JOURNAL should be sent to the Editorial Department, American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill. They should be typewritten, double-spaced, with a maximum of 250 words, and should be submitted as soon as possible, since it takes about six weeks before they appear in the JOURNAL.

Articles for the *Auxiliary News*, which is published annually in the spring, should follow the same pattern as those for the JOURNAL; however, the deadline is Feb. 15, 1959. These are sent to Mrs. Wayne H. Riser, 5335 Touhy Ave., Skokie, Ill. It is urged that pictures of the auxiliary officers be included whenever possible. (A fee of $4.85 for the cut should accompany the picture.) Be

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sure to give the full name (with husband's initials) and home town, and identify from left to right.

Mrs. Earl N. Moore extended greetings to the Women's Auxiliary from the men and women of the veterinary profession in India. They hope to organize an auxiliary there in the near future, but their greatest barrier, she said, is the language problem. She stated that they would certainly need help from the Women's Auxiliary to the AVMA. Mrs. Moore expressed her thanks to the officers who carried on for her while she was president and living in India at the same time.

Mrs. Austin W. Eivers, reporting for the Nominating Committee (Mrs. Robert A. Merrill, chairman), stated that 73 letters were sent to state auxiliaries requesting names of women for committee appointments. Only 22 answers were received. She suggested that letters be sent to auxiliaries prior to their annual meetings so that nominations will be taken up by the respective executive boards. She also urged that names submitted for nomination be sent to the national membership secretary for verification before being filed.

Mrs. C. L. Nelson, new chairman of the Nominating Committee, emphasized the necessity of obtaining the consent of the prospective nominee before sending in her name. All qualifications and abilities should be listed, as all committee appointments come from the nominating file.

Mrs. E. E. Leasure discussed the complimentary memberships which are given to the wives of graduating veterinary students. Each year, approximately 500 are given, and they are in effect for the remainder of the calendar year. Over half have renewed their membership at the end of the six months and have been active, interested members of the AVMA Auxiliary. She then discussed the student awards, which are presented to the outstanding senior veterinary student at each of the 19 schools in the United States and Canada.

Mrs. James I. Cornwell outlined the procedures used with the handling of the Student Loan Fund. Senior students receive preference. The loan carries an interest rate of 2 per cent; half of the amount borrowed must be repaid in two years from date of note, and the balance in three years from date. Each applicant must furnish two endorsers, two faculty recommendations, and a letter stating the reason for application.

Mrs. John D. Stevens and Mrs. Frank R. Booth discussed the honor roll requirements.

Mrs. J. J. Fishler, chairman of the Public relations Media Committee, introduced Dr. C. E. DeCamp of New York, who spoke on the importance of public relations in the auxiliaries and what each woman could do along that line. He pointed out that everyone has public relations value. Every wife should remember that she is not only constantly representing her veterinarian husband, but all veterinarians as well. He also stressed that we should welcome new veterinarians into the area, as intraprofessional relations are as important as relations with the other professions.

Mrs. S. R. Purvis, Michigan, described a contest in her state in which points were given for the clipping service, one of the projects in connection with the Public Relations Committee. Brian Forster, public relations director for the AVMA, gave his thanks and appreciation for the success of the clipping service and asked that more material be sent to the newspapers from the state and local associations. The auxiliaries were asked to continue this clipping service and to send all possible clippings to him at the AVMA office.

Mrs. B. S. Pomeroy discussed some of the changes in regard to the proposed constitution and bylaws. She explained that with five vice-presidents, as is set up on the proposed constitution, there will be no progression of office.

Mrs. K. M. Curts, chairman of the Aids to Auxiliaries Committee, told of the purpose of this committee, which is to aid auxiliaries in planning interesting programs. They are starting a collection of skits suitable for presentation at meetings and which will be available to all auxiliaries.

Membership Advisory Committee chairman, Mrs. W. T. Oglesby, introduced the panel members for the discussion of building up membership. She asked that each auxiliary have a membership secretary.

Mrs. E. H. Gloss stressed that the basic duty of a membership secretary is to collect dues for the AVMA Auxiliary and send them in to the membership secretary within 30 days.

Mrs. Don W. Clarke talked on the part that hospitality plays in getting new members; and Mrs. P. S. Roy outlined a five-point program for membership meetings.

After a brief question-and-answer period, Mrs. C. M. Rodgers expressed her appreciation for the cooperation which was given before and during the conference.

s/Mrs. Austin W. Eivers, *Secretary.*

• • •

Loan Fund.—To be able to lend a helping hand when help is most needed is the purpose of the loan fund of the Women's Auxiliary to the AVMA. Without such a fund, many of our student veterinarians would have to curtail their training because they lacked funds for the completion of their education.

One student, later a recipient of money from the fund, had the courage to register for his senior year knowing that money was not available for even his room and board. The loan fund has helped many married students with families by augmenting their income.

Loans are made to selected students in accredited veterinary colleges, with seniors receiving preference. Applications from juniors are accepted if the fund balance is $3,000, and to graduate students if the balance is above $5,000. The sum of $500 is the maximum which may be borrowed.

Last year it was estimated that ten loans could be granted during the year. Before March 1, eight had been granted and two were being

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processed, which brought the total to the estimated number and made it necessary to refuse further applications for the remainder of the year.

We feel that by not being able to grant as many loans as might be possible, someone is being kept from obtaining a degree in veterinary medicine and is thus depriving the profession as a whole of the abilities and services which might contribute much to veterinary science.

Without contributions from auxiliaries and interested individuals, the work that is being done to assist veterinary students in furthering their education could not continue.

s/Mrs. T. S. Maddox, *First Vice-President.*

COMING MEETINGS

American Society of Animal Production. Fiftieth anniversary meeting. Sherman Hotel, Chicago, Ill., Nov. 28-29, 1958. Dr. H. H. Stonaker, Colorado State University, Fort Collins, secretary-treasurer.

Animal Care Panel and the American Laboratory Animal Breeders Association. Annual meeting. Hamilton Hotel, Chicago, Dec. 3-4, 1958. Dr. N. R. Brewer, correspondent.

Nebraska State Veterinary Medical Association. Annual meeting. Hotel Cornhusker, Lincoln, Dec. 3-5, 1958. W. T. Spencer, 1250 North 37th, Lincoln, Neb., secretary-treasurer.

Arizona Veterinary Medical Association. Annual meeting. Yuma Country Club, Yuma, Dec. 7-9, 1958. Robert E. McComb, Jr., Phoenix, program chairman; Thomas E. Lightle, Route 1, Box 817, Yuma, in charge of reservations.

Kentucky Veterinary Medical Association. Winter meeting. Irvin S. Cobb Hotel, Paducah, Ky., Dec. 8-9, 1958. L. S. Shirrell, 545 E. Main St., Frankfort, Ky., secretary-treasurer.

American Association of Equine Practitioners. Annual meeting. LaSalle Hotel, Chicago, Ill., Dec. 15-16, 1958. M. L. Scott, 42 W. Market St., Akron 2, Ohio, secretary-treasurer.

Southern California Veterinary Medical Association. Annual meeting. Beverly Hilton Hotel, Beverly Hills, Jan. 10, 1959. R. J. Schroeder, 1919 Wilshire Blvd., Los Angeles, Calif., program chairman.

Tennessee Veterinary Medical Association. Annual meeting. Noel Hotel, Nashville, Jan. 11-13, 1959. H. W. Hayes, 5009 Clinton Pike, Knoxville, secretary-treasurer.

Indiana Veterinary Medical Association. Annual meeting. Hotel Severin. Indianapolis, Ind., Jan. 14-16, 1959. George R. Burch, program chairman.

Iowa Veterinary Medical Association. Annual meeting. Hotel Fort Des Moines, Iowa, Jan. 20-22, 1959. F. B. Young, executive secretary.

Intermountain Veterinary Medical Association. Annual convention. Hotel Utah, Salt Lake City, Jan. 22-24, 1958. Douglas R. McKelvie, correspondent.

Oklahoma Veterinary Medical Association. Annual meeting. Mayo Hotel, Tulsa, Jan. 25-27, 1959. M. N. Riemenschneider, 122 State Capitol Bldg., Oklahoma City, secretary.

Minnesota State Veterinary Medical Society. Annual meeting. Leamington Hotel, Minneapolis, Jan. 26-28, 1959. B.S. Pomeroy, University of Minnesota, College of Veterinary Medicine, St. Paul 1, Minn. secretary-treasurer.

Louisiana State University. Annual conference. Pleasant Hill, Louisiana State University Campus, Jan. 27-28, 1959. William T. Oglesby, correspondent.

Maryland State Veterinary Medical Association. Winter meeting. Emerson Hotel, Baltimore, Md., Jan. 27-28, 1959. Harry L. Schultz, Jr., secretary-treasurer.

California Veterinary Medical Association. Midwinter conference. School of Veterinary Medicine, University of California, Davis, Feb. 2-4, 1959. John W. Kendrick, conference chairman.

Ohio State Veterinary Medical Association. Annual convention. Neil House Hotel, Columbus, Feb. 4-6, 1959. Harry C. Sharp, 1411 W. Third Ave., Columbus, Ohio, executive secretary.

Illinois State Veterinary Medical Association. Annual meeting. LaSalle Hotel, Chicago, Feb. 16-18, 1959. C. B. Hostetler, 1385 Whitcomb Ave., Des Plaines, executive secretary.

Third Pan American Congress of Veterinary Medicine and Ninety-Sixth Annual Meeting, American Veterinary Medical Association. Joint meeting. Kansas City, Mo., Aug. 23-27, 1959. H. E. Kingman, Jr., executive-secretary, AVMA, 600 S. Michigan Ave., Chicago 5, Ill. B. D. [illegible], secretary-general, Directing Council, Pan American Congress of Veterinary Medicine, P.O. Box 99, Azul, F.C.N.G.R., Argentina, S.A.

Foreign Meetings

International Veterinary Congress. Sixteenth session. Madrid, Spain, May 21-27, 1959. Prof. Pedro Carda A., general secretary, Calle Villanueva 11, Madrid.

U.S. COMMITTEE: Dr. W. A. Hagan, chairman, New York State Veterinary College, Ithaca, N. Y.; Dr. J. G. Hardenbergh, secretary, 600 S. Michigan Ave., Chicago 5, Ill.

Third World Congress on Fertility and Sterility Amsterdam, Holland, June 7-13, 1959. Dr. L. I. Swaab, Sint Agnietenstraat 4, Amsterdam, Holland, honorary secretary.

Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Association, the first Thursday of each month. Dr. G. W. Jones, Main St., Prattville, Ala., secretary-treasurer.

Jefferson County Veterinary Medical Association, the second Thursday of each month. S. A. Price, 213 N. 15th St., Birmingham, secretary.

Mobile-Baldwin Veterinary Medical Association, the third Tuesday of each month. W. David Gross, 771 Holcombe Ave., Mobile, Ala., secretary.

North Alabama Veterinary Medical Association, the second Thursday of November, January, March, May, July, and September, in Decatur, Ala. Ray A. Ashwander, Decatur, Ala., secretary.

North East Alabama Veterinary Medical Association, the second Tuesday of every other month. Leonard J. Hill, P.O. Box 761, Gadsden, Ala., secretary-treasurer.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2 Box 697, Tucson, Ariz., secretary.

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CALIFORNIA—Alameda-Contra Costa Veterinary Medical Association, the fourth Wednesday of Jan., March, May, June, Aug., Oct., and Nov. Leo Goldston, 3793 Broadway, Oakland 11, Calif., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of February, April, July, September, and December. Herb Warren, 3004 16 St., San Francisco, Calif., executive secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. R. B. Barsaleau, 2333 E. Mineral King, Vitalia, Calif., secretary.

Kern County Veterinary Medical Association, the first Thursday evening of each month. James L. Frederickson, 17 Niles St., Bakersfield, Calif., secretary-treasurer.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. W. H. Rockey, P. O. Box 121, San Luis Obispo, Calif., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90 Corral de Tierra, Salinas, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Covell, in Modesto, Calif. Lyle A. Baker, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. Chester A. Maeda, 766 E. Highland Ave., San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643-N. Main St., Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. R. M. Granfield, 2600 W. El Camino Real, San Mateo, Calif., secretary-treasurer.

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Redwood Empire Veterinary Medical Association, the third Thursday of each month. Robert L. Chandler, P.O. Box 8, Ukiah, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1795 Moore St., San Diego, Calif., secretary.

San Fernando Valley Chapter SCVMA, the second Tuesday of each month at 7:30 p.m., Hody's Restaurant, North Hollywood, Calif. Dr. V. H. Austin, 14931 Oxnard St., Van Nuys, secretary-treasurer.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Escobar Restaurant in Studio City. Dr. Rolf Reese, 23815 Ventura Blvd., Calabasas, Calif., secretary.

Santa Clara Valley Veterinary Association, the fourth Tuesday of each month. Kay Beulley, N. Fourth and Gish Rd., San Jose, Calif., secretary.

Southern California Veterinary Medical Association, the last Wednesday of each month. Don Mahan, 1919 Wilshire Blvd., Los Angeles 57, Calif., executive secretary.

Tulare County Veterinary Medical Association, the second Thursday of each month. D. E. Britten, 544 N. Ben Maddox, Visalia, Calif., secretary.

COLORADO—Denver Area Veterinary Medical Society, the fourth Tuesday of every month. Gene M. Bierhous, 2896 S. Federal Blvd., Englewood, Colo., secretary-treasurer.

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Northern Colorado Veterinary Medical Society, the first Monday of each month. M. A. Hammarlund, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

DELAWARE—New Castle County Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. A. P. Mayer, Jr., R.F.D. 2, Newark, Del., secretary-treasurer.

FLORIDA—Central Florida Veterinary Medical Association, the first Tuesday of each month, time and place specified monthly. Jack H. McElyer, 5925 Edgewater Drive, Orlando, Fla., secretary.

Florida West Coast Veterinary Medical Association, the second Wednesday of each month at the Lighthouse Inn, St. Petersburg. William F. Casler, 2540 30th Ave., N., St. Petersburg, secretary-treasurer.

Jacksonville Veterinary Medical Association, the first Thursday of every month. Dodsons Restaurant, P. S. Roy, 4443 Atlantic Blvd., Jacksonville, Fla., secretary.

Northwest Florida Veterinary Medical Society, third Wednesday of each month, time and place specified monthly. T. R. Geci, 108B Catherine Ave., Pensacola, Fla., secretary.

Palm Beach Veterinary Society, the last Thursday of each month in the county office building at 810 Datura St., West Palm Beach. J. J. McCarthy, 500-25th Street, West Palm Beach, Fla., secretary.

Ridge Veterinary Medical Association, the fourth Thursday of each month in Bartow, Fla. Paul J. Myers, Winter Haven, Fla., secretary.

South Florida Veterinary Society, the third Wednesday of each month. Time and place specified monthly. Joe B. O'Quinn, 1690 E. 4th, Hialeah, Fla., secretary.

Suwannee Valley Veterinary Association, the fourth Tuesday of each month, Hotel Thomas, Gainesville. W. B. Martin, Jr., 3002 N. W. 6th St., Gainesville, Fla., secretary.

Volusia County Veterinary Medical Association, the fourth Thursday of each month. A. E. Hixon, 131 Mary St., Daytona Beach, Fla., secretary.

GEORGIA—Atlanta Veterinary Society, the third Thursday of each month at the Elk's Home, 726 Peachtree St., Atlanta. Donald C. Ford, Forest Park, secretary.

ILLINOIS—Chicago Veterinary Medical Association, the second Tuesday of each month. Charles H. Armstrong, 1021 Davis St., Evanston, secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. Alfred G. Schiller, Veterinary Clinic, University of Illinois, Urbana, secretary-treasurer.

INDIANA—Central Indiana Veterinary Medical Association, the second Wednesday of each month. Peter Johnson, Jr., 4410 N. Keystone Ave., Indianapolis 5, secretary.

Michiana Veterinary Medical Association, the second Thursday of every month except July and December, at the Hotel LaSalle, South Bend, Ind. J. M. Carter, 3421 S. Main St., Elkhart, Ind., secretary.

Tenth District Veterinary Medical Association, the third Thursday of each month. J. S. Baker, P.O. Box 52, Pendleton, Ind., secretary.

IOWA—Cedar Valley Veterinary Medical Association, the second Monday of each month, except January, July, August, and October in Black's Tea Room, Waterloo, Iowa. A. J. Cotten, Grundy Center, secretary.

Central Iowa Veterinary Medical Association, the third Monday of each month, except June, July, and August, at 6:30 p.m., Breeze House, Ankeny, Iowa. John Herrick, Ames, secretary.

Coon Valley Veterinary Medical Association, the second Wednesday of each month, September through May, at 7:30 p.m., Cobblestone Inn, Storm Lake, Iowa. Robert McCutcheon, Holstein, secretary.

East Central Iowa Association, the second Thursday of each month at 6:30 p.m., usually in Cedar Rapids, Iowa. Dr. J. G. Irwin, Iowa City, secretary.

Fayette County Veterinary Medical Association, the third Thursday of each month at 6:30 p.m. in West Union, Iowa. H. J. Morgan, West Union, secretary.

Lakes Veterinary Association, the first Tuesday of each month, September through May, at 6:30 p.m., at the Gardson Hotel, Estherville, Iowa. Barry Barnes, Milford, secretary.

North Central Iowa Veterinary Medical Association, the third Thursday of April, at the Warden Hotel, Fort Dodge, Iowa. H. Engelbrecht, P. O. Box 797, Fort Dodge, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northwest Iowa Veterinary Medical Association, the second Tuesday of February, May, September, and December, at the Community Bldg., Sheldon. W. Ver Meer, Hull, secretary.

(*Continued on adv. p. 36*)

AVMA Research Fellowships Available

The Council on Research of the AVMA announces the availability of a number of fellowships for postgraduate training for the academic year, 1959-1960.

The recipient of a fellowship must be a veterinarian and a citizen of the United States or Canada. Veterinary students who expect to graduate at the end of the current school year and who wish to follow a career in research may apply for a fellowship.

The latest date for filing the completed application is Feb. 15, 1959. Approximately one month is required for processing completed applications after receipt by the secretary of the Council. Qualified persons should secure and submit applications as early as possible to insure their file being complete for presentation to the Committee on Fellowships.

The Committee on Fellowships of the Council on Research will meet in March to consider applications, and the awards will be announced soon afterward. The stipend will be determined in each case by the needs of the individual, the location of the school in which he proposes to work, and other factors. In general, the stipends range from $100 monthly and upward.

Any qualified person interested in graduate training may obtain application blanks and other information by writing to Secretary, AVMA Council on Research, C. H. Cunningham, College of Veterinary Medicine, Michigan State University, East Lansing, Mich.

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1. Charles Raker, V.M.D., Professor of Veterinary Surgery, University of Pennsylvania. Annual Meeting of the American Veterinary Medical Association, Aug. 18-21, 1958, Philadelphia, Pennsylvania.

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Exclusive Publication.—Articles submitted for publication are accepted with the understanding that they are not submitted to other journals, which is ethical publication procedure.

Manuscripts.—Manuscripts, including **footnotes, references,** and **tables,** must be typewritten, **double-spaced,** on 8½- by 11-in. bond paper, and the original and one carbon copy, submitted. One-inch margins should be allowed on the sides, with 2 in. at top and bottom. Articles should be concise. Short, simple sentences are clearer and more forceful than long, complex ones.

Illustrations.—Photographs should be furnished in glossy prints, and of a size that will fit into the JOURNAL of the American Veterinary Medical Association with a minimum of reduction. Photomicrographs which can not be reduced should be marked for cropping to 1-column or 2-column width. Identifying marks within the photomicrographs, such as arrows, letters, or numbers, should be clearly marked with black India ink or white opaque ink to insure good contrast for reproduction and must be large enough to stand reduction, if necessary.

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Tables.—Tables should be simple and typed **double space.** Complex tables are not conducive to perusal. It is wiser to summarize complex material than to tabulate it.

References.—References should be typed **double space,** in alphabetical order, and should be prepared in the following style: name of author, title of article, name of periodical with volume, year, and page numbers. References to journals not commonly known should give the complete name of the periodical, and where published so that they may be added to our reference files. When books are cited, the name of publisher, location, edition, and year should be given.

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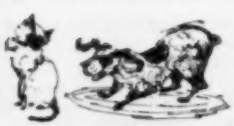

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Southeastern Iowa Veterinary Association, the first Tuesday of each month at Mt. Pleasant, Iowa. Warren Kilpatrick, Mediapolis, secretary.

Southwestern Iowa Veterinary Medical Association, the first Tuesday of April and October, Hotel Chieftain, Council Bluffs, Iowa. J. P. Stream, Creston, secretary.

Upper Iowa Veterinary Medical Association, the third Tuesday of each month at 7:00 p.m., at All Vets Center, Clear Lake, Iowa. Richard Baum, Osage, secretary.

KENTUCKY—Central Kentucky Veterinary Medical Association, the first Wednesday of each month. R. H. Folsom, P.O. Box 323, Danville, Ky., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday of each month in Louisville or within a radius of 50 miles, except January, May, and July. G. R. Comfort, 2102 Reynolds Lane, Louisville, Ky., secretary-treasurer.

MARYLAND—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m., at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Norman Herbert, 3506 Joann Drive, Baltimore 7, Md., secretary.

MICHIGAN—Central Michigan Veterinary Medical Association, the first Wednesday of every month at 7 p.m. Frank A. Carter, P.O. Box 78, Carson City, Mich., secretary.

Mid-State Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

Southeastern Veterinary Medical Association, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14093 E. Seven Mile Rd., Detroit 5, Mich., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of each month (except July and August), at the Coronado Hotel, Lindell Blvd. and Spring Ave., St. Louis, Mo., at 8 p.m. Edwin E. Epstein, 4877 Natural Bridge Ave., St. Louis 15, Mo., secretary.

Kansas City Veterinary Medical Association and Kansas City Small Animal Hospital Association, the third Thursday of each month at the Hotel President, Kansas City, Mo. Frank A. O'Donnell, Parksville, Mo., secretary-treasurer.

NEVADA—Western Nevada Veterinary Society, the first Tuesday of each month. Paul S. Silva, 1170 Airport Road, Reno, Nev., secretary.

NEW JERSEY—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May at Old Hights Inn, Hightstown, N. J. David C. Tudor, Cranbury, N. J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April, except December, at the Irvington House, 925 Springfield Ave., Irvington, N.J. Bernard M. Weiner, 787 Clinton Ave., Newark, N.J., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Elks Club, Hackensack. Burritt Lupton, 569 Franklin Ave., Wyckoff, secretary.

Northwest Jersey Veterinary Society, the third Wednesday of every odd month. G. L. Smith, P.O. Box 938, Trenton, N.J., secretary.

Southern New Jersey Veterinary Medical Association, the fourth Tuesday of each month at the Collingswood Veterinary Hospital, Collingswood. R. M. Sauer, secretary.

Dr. Gessert Joins Upjohn's Veterinary Staff

Dr. Roland Arthur Gessert (MSC '50), formerly with the F.D.A., has joined the staff of the Veterinary Medical Department at The Upjohn Company. He is a large animal specialist and has extensive background in the fields of bovine ketosis and nutrition.

Dr. Gessert's undergraduate work was in the field of dairy husbandry, and his graduate work was done in the field of animal nutrition. Following graduation and four years with the Army, Dr. Gessert was in private practice and later worked

Dr. Roland A. Gessert

as a research associate at the University of Maryland, specializing in metabolic diseases of dairy cattle and rumen nutrition.

From 1955 until his employment by Upjohn, Dr. Gessert was an assistant veterinary medical director for the F.D.A. in Washington, D.C. Dr. Gessert is a member of the American Association of Veterinary Physiologists and Pharmacologists and the American Association of Veterinary Nutritionists. He is the author of articles on bovine ketosis, animal nutrition, and the relationship of F.D.A. to veterinary medicine.

A Hen Yolk with Seven Blastodisks.—Yolks with two blastodisks have been reported, including twin pigeons from an egg with one yolk. It was surmized that the two blastodisks originated from a fusion of two yolks. An egg with seven blastodisks is described; this doubtless could not have resulted from fusion of seven yolks. The yolk was no larger than normal.—*Poult. Sci.* (*May, 1958*): *512.*

NEW MEXICO—Bernalillo County Veterinary Practitioners Association, third Wednesday of each month, Fez Club, Albuquerque, N.M. Jack Ambrose, 3018 N. Rio Grande Blvd., Albuquerque, secretary-treasurer.

NEW YORK—New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

New York State Veterinary College, Annual conference for veterinarians. Cornell University, Ithaca. W. A. Hagan, New York State Veterinary College, Cornell University, Ithaca, N. Y., dean.

Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 50 University Ave., Rochester, N. Y., secretary.

NORTH CAROLINA—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel, Greensboro. W. R. Dobbs, Box 869, Albemarle, secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month, time and place specified monthly, Byron H. Brow, Box 453, Goldsboro, N. Car., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month. T. L. James, Box 243, Newton, N. Car., secretary.

Twin Carolinas Veterinary Medical Association, the third Friday of each month at Orange Bowl Restaurant, Rockingham, N. Car., at 7:30 p.m. J. E. Currie, 690 N. Leak St., Southern Pines, N. Car., secretary.

Western North Carolina Veterinary Medical Association,

(*Continued on adv. p.* 43)

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for mastitis ... *as an adjunct to proper herd management* • *Proven clinical effectiveness against the majority of causative organisms . . . staphylococci, streptococci, Escherichia and Pseudomonas . . .*[1,2] • *Little or no development of bacterial resistance*[2]*— no antibiotic cross-resistance . . .* FURACIN®

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References: 1. Kakavas, J. C.; Roberts, H. D. B.; de Courcy, S. J. and Ewing, D. L.: J. Am. Vet. M. Ass. 119:203 (Sept.) 1951. 2. Kakavas, J. C.: Antibiotics Annual 1954-1955, New York, Medical Encyclopedia, Inc., 1955, p. 323. 3. Mires, M. H. and Chadwick, R. H.: Vet. News 10:3 (Jan.-Feb.) 1947. 4. Mires, M. H.: J. Am. Vet. M. Ass. 117:49 (July) 1950. 5. Mires, M. H.: Vet. News 14:9 (May-June) 1951. 6. Roberts, H. D. B.; Kakavas, J. C. and Biddle, E. S.: N. Amer. Vet. 34:247 (April) 1953.

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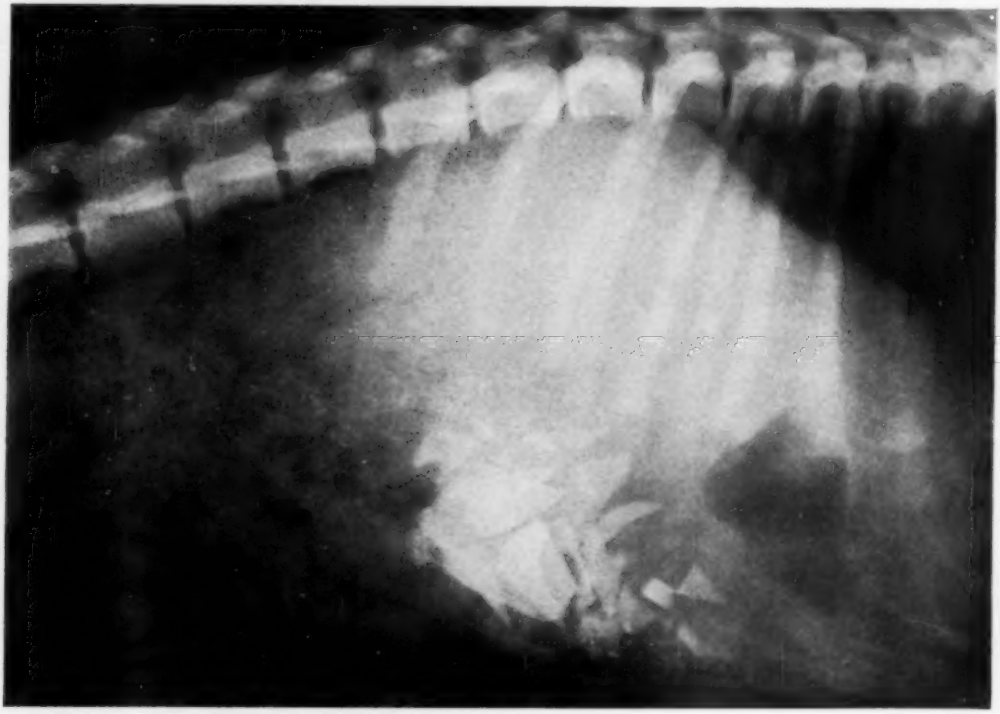

Figure 1

History.—A male Boxer, 10 months old, was left in the kitchen with a bag of groceries. Upon the owner's return, the groceries were scattered on the floor and several glass jars were broken. The contents of a broken peanut butter jar had been consumed, and possibly some of the glass jar. The dog was drooling excessively and the saliva was slightly blood-tinged from a cut on the lower lip. Otherwise, the dog seemed normal and ate additional food. The following morning a radiograph was taken.

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—An accumulation of numerous angular, radiolucent objects in the region of the stomach of the Boxer. Upon gastrotomy, the objects proved to be pieces of glass from the peanut butter jar.

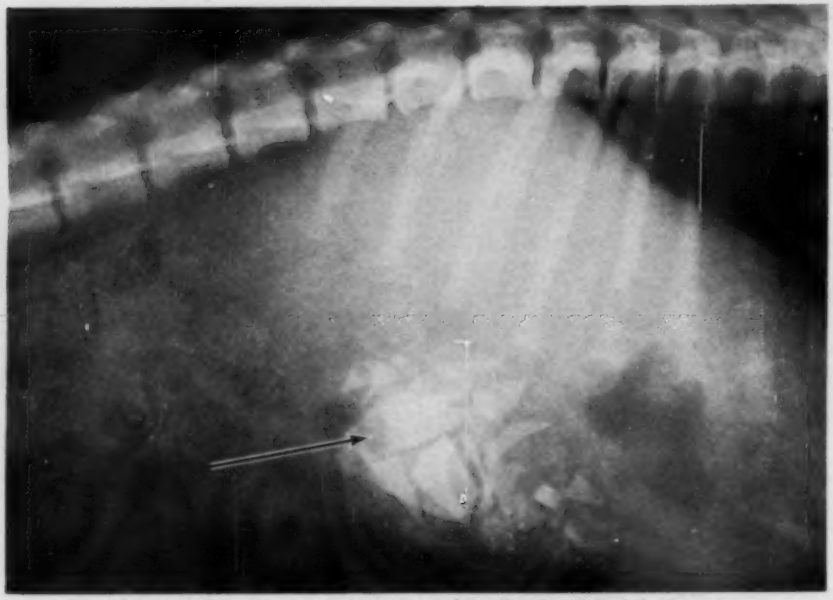

Fig. 2—Radiograph showing broken glass (arrow) in stomach of the Boxer.

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This case was presented by members of the staff of the North Shore Animal Hospital, Evanston, Ill.

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Southwest Virginia Veterinary Medical Association, the first Thursday of each month. D. F. Watson, Blacksburg, secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Monday of each month, Magnolia American Legion Hall, 2870 32nd W., Seattle. Roy C. Toole, 10415 Main St., Bellevue, secretary.

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